

RED DATA BOOK  
FOR THE  
MALTESE ISLANDS

Edited by  
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AND  
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# Red Data Book for the Maltese Islands

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Foreword by Minister of Education

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## FOREWORD

In my father's library, I came across, very early in life, the book by Sommer and Caruana Gatto and I was struck by the richness of the flora of our small islands. Despott's contributions to the study of our ornithology and his letters to my father, which I went through in my teens, kindled in me an interest in our rich fauna. I am therefore proud to be asked to write a foreword to this work by the Environment Division of my Ministry, which should light the spark in the minds of young and old and turn the greatest number of our citizens into environmentalists.

I was, however, surprised to note that a large number of species are under threat. The present study brings home to us in a most emphatic manner the fact that many species, which form part of the rich Maltese ecosystem are in a precarious position.

During the millenia since the first inhabitants came to these islands, there has always been a continuous change in the ways of life, and this change has always resulted in more ways than one, in some pressure on the character of the Maltese countryside with the result that, while a few species benefitted and became ubiquitous, many others became rarer and some even extinct.

This study, which can be best described as a stock-taking exercise of the situation of the Maltese flora and fauna, is pointing to all of us the responsibility that we should shoulder in allowing these species to continue to co-exist with us on these Islands. Where endemic species are involved, the parameters of our responsibility are even wider and greater. The extermination of endemic species from the Maltese Islands is in fact their extinction from the face of the Earth.

I congratulate the editors as well as the contributors for producing such a worthwhile scientific study which is also a credit to the Environment Division.



UGO MIFSUD BONNICI  
Minister of Education

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## INTRODUCTION

Although the Maltese Islands have a very limited geology and a relatively homogeneous landscape, and consequently a narrow range of habitat types, yet they still provide a home for a rich and diverse array of plants and animals, including a large number of endemic species. The term 'endemic' means confined to a particular region, therefore an organism which is endemic to the Maltese Islands occurs here only and is not found anywhere else in the world. Such organisms are of exceptional importance, if for nothing else, because they are uniquely Maltese, but also for their scientific interest. However, their very uniqueness makes them particularly vulnerable: should they become extinct from our islands, they will have disappeared from the face of the Earth and there is nothing anybody can do to bring them back.

Very few of the groups of plants and animals which populate the Maltese Islands have been thoroughly investigated and there are whole groups which we know next to nothing about. However, even this incomplete knowledge is sufficient to show that a great many different types of organisms share our islands with us. Limiting ourselves to terrestrial and freshwater organisms only, these include about 1000 flowering plants and about another 1000 lower plants such as mosses, liverworts, lichens, fungi and algae; some 50 molluscs, about 500 species of arachnids, more than 100 crustaceans, more than 3000 insects, one amphibian, nine reptiles, some 180 birds and some 20 mammals. Additionally, a number of flying insects, birds and possibly some bats regularly migrate to the islands and spend part of their life here. If to these are included the marine forms found in our territorial waters, then the total number of species would more than double.

Quite apart from its diversity, the Maltese flora and fauna is important in other ways. The Maltese Islands are located in the central Mediterranean, close to the Siculo-Tunisian sill which divides the Sea into a West and an East Basin. The Maltese marine biota contains elements from both subzones and is therefore interesting as a meeting point of two Mediterranean biogeographical regions. The terrestrial biota of the Maltese Islands is also of biogeographical interest. Being situated halfway between the European Mediterranean lands and the African Mediterranean lands, which are quite different in terms of their biota, the Maltese Islands are again on the border of two biogeographical regions.

After climate, the single most important factor affecting the ecology of the Maltese Islands is man. Human activities have shaped the land since prehistoric times when the first permanent settlers started felling the local forests to clear land for agriculture. Since those times, the trend has always been for the human population of the islands to increase, and this has resulted in a concurrent increase in the intensity of human impact on the environment. There is no place on the islands which has not been affected by man or his activities and the plants and animals that we now find living here are those which have either adapted to this man-dominated environment, or those which manage to survive in refugia relatively inaccessible to humans. Until some 100 years ago, man and the local wildlife coexisted in equilibrium, however, this equilibrium is now shifting. This is due partly to an increase in human population, including a high influx of tourists in recent years, but mainly to the islands entering an accelerated phase of development and to the use of modern technology. Human pressure on the local environment has increased tremendously in the past 20 years and there is no sign that this pressure is going to slacken in the near future; if anything, it is likely to increase. It is difficult to gauge what the end result on the local wildlife is going to be. Without doubt however, the character of our countryside will change and from past experience of similar

situations in other countries, this change is going to involve the extinction of some of our fauna and flora, some species previously common becoming rare, and others already benefitting from human activities becoming more widespread and common. Previous experience also suggests that the wildlife that will suffer the most severe negative effects is likely to be that which forms the more interesting element of our biota: the indigenous and/or endemic species. Additionally, the indigenous flora and fauna is also under threat of being outcompeted and displaced by a variety of alien species which have been introduced into the islands over the years, sometimes by natural processes, but more often through human agency.

Should we worry that a number of local plants and animals have become extinct from our islands? Should we be concerned that others, previously common, are becoming rare? In short, should we conserve our wildlife? We strongly feel that the answer to all these questions is an emphatic 'yes'. There are many reasons for this. Most people love nature and enjoy relaxing in the countryside, smelling the scent of flowers and watching animals going about their activities. Important though this is, there is a more practical aspect. No species, man included, lives in isolation, but life is only possible as part of a complex system involving non-living and living components constantly interacting together: an **ecosystem**. On a large scale, human life on the planet depends on the smooth functioning of the global ecosystem; on a smaller scale, life on our tiny islands depends on the smooth functioning of our own Maltese ecosystem. All local wildlife is part of this system; no species is superfluous. The scientific and cultural importance of local wildlife has already been alluded to. Studies on local species, particularly those endemic to our islands, are revealing their affinities and shedding light of from where, and when, their ancestors reached our shores in the course of their evolution. Our endemic wildlife is as unique to our islands as are our prehistoric and later monuments. We have a moral obligation to preserve this cultural heritage for posterity, not just future generations of Maltese, but for all mankind since the extinction of an endemic species would be an irreparable loss to world heritage.

Of the several thousand species of organisms that inhabit our islands and the seas around them, which ones are threatened and in need of protection? Which ones are at risk because they are endemic or rare or both? Which ones are of particular scientific and/or cultural interest? This work is an attempt to answer these questions by providing an inventory of local species of plants and animals which are threatened, endemic, rare or of particular interest and hence with top priority for protection. This list is arranged on the same general lines as the *Red Data Books* published by the **International Union for the Conservation of Nature and Natural Resources**. Since the mid-1960s, the IUCN, as it is popularly known, through one of its commissions, the **Survival Service Commission**, has been producing synoptic lists of threatened species in a series of publications called *Red Data Books*. To date there are six of these dealing with: mammals, birds, amphibians and reptiles, fish, flowering plants and invertebrates. For each species included in a *Red Data Book*, the scientific and common names are given together with status, distribution, population size, habitat, conservation needs and conservation actions taken. Because the IUCN's *Red Data Books* are world-wide in scope, only a very limited number of species can be included and these are those which are threatened on a global scale. The need for more regional lists which give detailed information on local species has also been felt and many countries publish *National Red Data Books* modelled on the IUCN's international ones. The present work is a first attempt at providing a *National Red Data Book* for the Maltese Islands.

The task of gathering information for the production of such a national list is a very hard one, particularly because of the paucity of biological information available on local biota. The first problem that has to be faced is which species to include. Since there is no really objective way for deciding this, it is a matter of professional judgement of the various contributors. These contributors were therefore chosen both for their taxonomic and for their field knowledge of the various groups they concern themselves with. This is important because there are available very few taxonomic works on local biota, and even fewer on their field biology; consequently, much of the information included here is original, previously unpublished data based on the authors' own research.

Each contribution is arranged as follows:

- + an introduction by the author setting out the criteria adopted for including or excluding species, and other norms;
- + a classified species list;
- + a list of literature cited.

For each entry, the following are given:

- + the genus/subgenus/species/subspecies or lower taxon, and the author of the taxon;
- + the common English and Maltese names where available;
- + a code describing status;
- + a brief note on taxonomy, distribution, threats, conservation and/or other information where relevant.

Symbols used are as follows:

- (?) In front of a species name indicates **uncertain taxonomic status**;
- indicates a taxon **endemic** to the Maltese Islands; the name of a particular island or islands in parentheses following this symbol indicates that the taxon is endemic to that particular island or group of islands;
- X taxon is now **extinct** from the Maltese Islands;
- E taxon is **endangered** locally;
- V taxon is **vulnerable** locally;
- R taxon is **rare** locally;
- RR taxon is **very rare** locally;
- I taxon's status in the Maltese Islands is **not known**;
- Rest(MI) taxon has a **restricted distribution in the Maltese Islands**;
- Rest(MED) taxon has a **restricted distribution in the Mediterranean region**;
- (?) following any other symbol signifies **uncertainty in the information given**.

Status categories are the same as those used by the IUCN with minor modifications:

*endangered* - taxon is in danger of extinction due to populations having become severely depleted or due to a drastic reduction in habitat;

*vulnerable* - taxon is likely to become endangered in the near future if the factors threatening it continue to operate (over-exploitation, extensive destruction of habitat, environmental disturbance);

*rare* - taxon is not at present endangered or vulnerable but because of its rarity in the Maltese Islands is at risk;

*very rare* - taxon is at risk because it is very rare in the Maltese Islands either because it is restricted to a particular locality or to a habitat type itself rare in the Maltese Islands or because it is thinly scattered;

*indeterminate* - taxon may or may not be under threat but insufficient information is currently available.

It is obvious that assignation of a particular taxon to one or other of the above categories is based on the subjective judgement of the individual contributors and is therefore open to dispute. We feel that this element of subjectivity is not all that important considering that in most cases no previous assessments of distribution and status in the Maltese Islands have been made. We feel that it is more important to have available at least some information on the local endemic and threatened biota even if our knowledge is still rudimentary rather than wait until more studies have been carried out (by which time it may be too late to help the species concerned!).

We end this introduction to the Maltese *Red Data Book* on a personal note. While we have taken great satisfaction in editing this work yet we have also been much saddened by the very large number of species that are listed as under threat. We are particularly depressed by the relatively numerous 'X' status codes in the lists, each one of which marks a species no longer to be found alive in our country. We make a strong appeal to all users of this work to do all they can to make sure that future lists of threatened Maltese wildlife will not be longer than the present one.

Finally, we extend our thanks to the authors of the various lists without whose dedicated research and patience at our editorial revisions this publication would not have been possible. We are especially indebted to Mr George Bezzina who painstakingly typesetted all the contributions and who suffered our innumerable editorial modifications without complaint.

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# THE FLORA

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## INTRODUCTION

In preparing this list all available literature records have been critically reviewed and evaluated on the basis of my experience on the frequency of the various species. In dealing with species which no longer seem to exist, I have generally included only those the presence of which has been confirmed by existing herbarium material (mainly that of the Argotti Botanic Gardens [ARG], however use has also been made of the herbaria at Kew [KEW], at the British Museum (Natural History) [BM], at Catania [CAT], and at Palermo [PAL]), or those which are so distinctive that errors in identification are ruled out. I have excluded those records for which the above criteria do not apply although I do not doubt that some of them did indeed exist. I have also excluded extinct species which, though their former presence is confirmed, were most probably adventive (e.g. *Solanum sodomaeum* L.). As for extant species I have excluded those which are certain alien introductions. In a very few cases, however, I have included rare adventives if they happen to be threatened on a worldwide scale (e.g. *Enarthrocarpus pterocarpus* (Persoon) DC.).

In preparing this list I was asked to supply vernacular names in English and Maltese. It must be appreciated that vernacular names are very unstable and plastic. A single name may serve a large variety of species which may even be completely unrelated. Names have a habit of being applied and eventually sticking on to the wrong plants through misuse so that such abuses become entrenched in the language and have to be allowed for. Some plants may sport a large variety of names while others may have no vernacular names at all. I must also stress that some vernacular names in Maltese are as yet unrecorded and only await the encounter of a field linguist with persons who happen to know such names. Moreover, no rules exist to govern the usage of vernacular names. Where no popular vernacular names exist I have adopted some of the new names coined by Haslam et al. (1979) although I took the liberty to reject some of these as not being quite suitable. I have also used my discretion in coining numerous new names. In doing this I have adopted a 'generic' name (e.g. *Kobbejża*, *Tulliera*, *Pleabane*, *Spurge* etc.) and applied a suitable qualifying epithet. In many cases no such 'generic' names exist and for these I have adapted the scientific generic name where this was euphonous. In a number of cases I have refrained from coining any names.

For the flowering plants I have followed the family sequence adopted by Pignatti (1982). This does not imply my unconditional recognition of this sequence, however.

In going through the list of vascular plants it will be noticed that plants from certain habitats e.g. freshwater rock-pools, saline marshes, sand dunes, water courses, feature prominently. These are habitats which have been especially degraded by human interference and it is important that efforts are directed to rehabilitate them. The greatest threats to the land (and freshwater) flora come



from building development and concomitant infrastructural works such as roads, quarries and dumping which lead to habitat destruction and modification leading in turn to a loss of species diversity.

Arrangement of species listed

- A.      Division:      TRACHEOPHYTA (Vascular Plants)
- Class:        LYCOPSIDA (Club-mosses & Quillworts)
- Class:        FILICOPSIDA (Ferns)
- Class:        CONIFEROPSIDA (Conifers)
- Class:        GNETOPSIDA (Gnetads)
- Class:        ANTHOPSIDA (Flowering Plants)
- Sub-class:    MAGNOLIIDAE (Dicotyledons)
- Sub-class:    LILIIDAE (Monocotyledons)
- B.      MARINE FLORA
- a. SEA-GRASSES
- b. ALGAE
- Division:    CHLOROPHYTA (Green Algae)
- Class:    BRYOPSIDOPHYCEAE (Siphonaceous Algae)
- Division:    PHAEOPHYTA (Brown Algae)
- Class:    PHAEOPHYCEAE
- Division:    RHODOPHYTA (Red Algae)
- Class:    FLORIDEOPHYCEAE (Higher Red Algae)
- C.      FUNGI
- a. MACROFUNGI
- Division:    EUMYCOTA (Higher Fungi)
- Sub-division: ASCOMYCOTINA (Bag Fungi)
- Class:    PYRENOMYCETES
- Class:    DISCOMYCETES

Sub-division: BASIDIOMYCOTINA (Club Fungi)

Class: HYMENOMYCETES

Class: GASTEROMYCETES

b. MICROFUNGI

Division: EUMYCOTA (Higher Fungi)

Sub-division: ASCOMYCOTINA (Bag Fungi)

Class: LOCULASCOMYCETES

Class: PYRENOMYCETES

Class: DISCOMYCETES

Sub-division: BASIDIOMYCOTINA (Club Fungi)

Class: TELIOMYCETES

Sub-division: DEUTEROMYCOTINA (Imperfect Fungi)

Class: COELOMYCETES

Class: HYPHOMYCETES

D. Division: BRYOPHTA

Class: HEPATICOPSIDA (Liverworts)

Class: BRYOPSIDA (Mosses)

E. LICHENS

F. FRESHWATER ALGAE

Division: CHAROPHYTA (Stoneworts)

Class: CHAROPHYCEAE

Division: RHODOPHYTA (Red Algae)

Class: BANGIOPHYCEAE (Lower Red Algae)

Division: CYANOBACTERIA (Blue-green Algae)

Class: CYANOPHYCEAE

## SPECIES LIST

### A. VASCULAR PLANTS

Division: TRACHEOPHYTA (Vascular Plants)

Class: LYCOPSIDA (Club-mosses and Quillworts)

*Selaginella denticulata* (L.) Spring R, Rest (MI)  
[Tooth-leaved Clubmoss]

The only clubmoss occurring in the Maltese Islands.

*Isoetes hystrix* Bory var. *subinermis* Durieu X(?)  
[Sand Quillwort]

Seems to have been found only by Edward Armitage (1822-1906) (Armitage, 1889) who visited Malta for brief spells during the winter 1888-89 and again in 1891 (Sommier & Caruana Gatto, 1915). According to Sommier & Caruana Gatto (op.cit.) his specimens are conserved in the Rome herbarium. No locality is given. In a copy of the work by Sommier & Caruana Gatto, which used to exist at the National Library, Valletta, a handwritten note which I attribute to Prof. John Borg indicates the plant as existing at "Boschetto".

Class: FILICOPSIDA (Ferns)

*Pteridium aquilinum* (L.) Kuhn E, Rest (MI)  
[Bracken; Maltese: Feliċċilla, Feliċċja, Feliċi t'Għawdex]

Extremely rare, confined to one locality in Gozo.

*Asplenium marinum* L. X(?)  
[Sea Spleenwort]

Used to occur in a few localities in Malta and Gozo. Seems to have gradually disappeared. No records for at least 50 years.

*Asplenium trichomanes* L. X(?)  
[Common Spleenwort]

Records (Gulis, 1872b; Duthie, 1875; Borg in Sommier & Caruana Gatto, 1915) indicate the presence of this species in a few localities in Malta and Gozo. Not seen for at least 70 years.

*Asplenium ceterach* L. E, Rest (MI)  
(= *Ceterach officinarum* DC.)  
[Rusty-back Fern]

Still persists in some three localities in Malta but always in very restricted numbers. Records from Gozo are unsubstantiated.

*Asplenium sagittatum* (DC.) A.J. Bange E, Rest (MI)  
 (= *Phyllitis sagittata* (DC.) Guinea & Heywood; *Phyllitis hemionitis*  
 O. Kuntze)  
 [Mule's Fern; Maltese: Felċi tal-Bir, Lsien id-Ċerv]

Seems to have become extremely rare, possibly already extinct but might still persist in Gozo. Records of the related *Asplenium scolopendrium* L. (= *Phyllitis scolopendrium* (L.) Neuman = *Scolopendrium vulgare* Smith) in Gulla (1872) and Borg (1927) could not be confirmed.

Class: CONIFEROPSIDA (Conifers)

*Tetraclinis articulata* (Vahl) Masters E, Rest (MED+MI)  
 (= *Callitris articulata* (Vahl) Link)  
 [Alerce, Sandarac Gum Tree; Maltese: Gharghar]

Only a very few trees still survive in the wild, nearly all of which are at Maqluba (Qrendi). Its geographical range is very restricted with Malta and a locality in the vicinity of Cartagena (South Spain) being the only European stations. Also occurs in western North Africa. It is listed in the Council of Europe's "List of rare, threatened and endemic plants of Europe" (Council of Europe, 1982).

Class: GNETOPSIDA (Gnetads)

*Ephedra fragilis* Desfontaines X  
 [Shrubby Horsetail]

Records of this species are based on Grech Delicata (1853) who records it from Wārdija. It has never been found by anybody else. The huge female specimen growing at the Argotti Botanic Gardens is reputed to have originated from native stock however there is nothing to substantiate this. Since the plant is very distinct, it is being given the benefit of the doubt.

Class: ANTHOPSIDA (Flowering Plants)

Sub-class: MAGNOLIIDAE (Dicotyledons)

Family: SALICACEAE

*Salix alba* L. E, Rest (MI)  
 [White Willow; Maltese: Żafżafa Bajda, Żafżafa Kbira]

Only one tree, a male, is still extant, this tree is therefore in grave danger of extinction.

*Salix pedicellata* Desfontaines E, Rest (MED+MI)  
 [Mediterranean Willow; Maltese: Żafżafa, Żafżafa Żgħira]

Only a few small populations consisting entirely of male trees still remain and their size is gradually diminishing.

*Populus alba* L.  
[White Poplar; Maltese: Luqal]

R, Rest (MI)

Few native stands still remain, the most noteworthy are those of Wied il-Luq (Buskett) and Girgenti. It is also planted in wet habitats such as Wied il-Qlegha (Chadwick Lakes).

Family: *Fagaceae*

*Quercus ilex* L.  
[Holm Oak, Evergreen Oak, Ilex Oak; Maltese: Balluta, Sığra tal-Gandar]

R, Rest (MI)

A small copse exists at Wardija which includes some trees which may be between 500 and 900 years old, possibly the oldest trees in the Maltese islands. These are technically protected by virtue of the Antiquities Act of 1925 and were in fact listed in an appendix of a Government Notice appearing in the 19th July issue of the *Malta Government Gazette* in 1933, intended as an appendage to the Antiquities Act. A few specimens occur in other localities such as Wied Mażrun, Imġiebah and Il-Bosk, which are possibly the relicts of ancient woods.

Family: *Ulmaceae*

*Ulmus canescens* Melville  
[Grey-leaved Elm; Maltese: Ulmu, Sığra tan-Nemus]

E, Rest (MED+MI)

First recorded by Sommier & Caruana Gatto (1915) as *Ulmus campestris*, a name which belongs to another species. Haslam et al. (1977) suggested that the Maltese trees may belong to *U. canescens*, however they had not seen the plants and thus their suggestion could not be verified at the time. Eventually two small stands of native elms were located and their true identity verified (Briffa, 1981). The Grey-leaved Elm is a very rare tree and since it grows on very fertile land it has been persecuted. One of the populations was accidentally (?) burnt down in 1982 (Briffa, personal communication). This species is an eastern Mediterranean element of our flora. The Maltese name "*Sığra tan-Nemus*" (sometimes "*Nemmies*") has originated from the large galls caused by the aphid *Schizoneura lanuginosa* Hartig, which may also become filled by other insects as parasites on the aphids or asinquillines (Caruana Gatto, 1925; Briffa, 1981; Lanfranco, 1984). Some other elms have been introduced for planting in moist places. Examples are *Ulmus procera* Salisbury (Għajn Rihana) and *Ulmus minor* Miller (Buskett Valley). These should not be confused with the indigenous species.

Family: *Urticaceae*

*Parietaria cretica* L.  
[Cretan Pellitory; Maltese: Xeht Ir-Rih tal-Gzejjer]

E, Rest (MED+MI)

Known only from a very small population along the northern edge of St. Paul's Island (NW Malta) (Lanfranco, 1983).



*Parietaria lusitanica* L.

R, Rest (MI)

[Mediterranean Pellitory; Maltese: Xeħt ir-Riħ tal-Blat]

Occurs in small numbers in a few valleys in Malta and Gozo.

Family: *S a n t a l a c e a e*

*Thesium humile* Vahl

R, Rest (MI)

This hemiparasitic plant occurs scattered in a few places in Malta, Gozo and Comino. Its populations appear to be on the decline.

Family: *A r i s t o l o c h i a c e a e*

*Aristolochia clusii* Lojacono

E, Rest (MED+MI)

[Southern Birthwort; Maltese: Aristolokja]

This very rare species is restricted to S. Italy, Sicily and Malta. With us it is confined to just three valleys. This species has usually been confused with *Aristolochia longa* L., under which name it has featured in all the Maltese floras. The true identity of our plants was clarified by Nardi (1984).

Family: *P o l y g o n a c e a e*

*Polygonum equisetiforme* Sinthorp & Smith

E, Rest (MED+MI)

[Horsetail Knotgrass]

Used to occur on Manoel Island but destroyed by development. Some material was transplanted to the Argotti Botanic Gardens where it still survives. Native status uncertain (Lanfranco, 1971).

*Polygonum maritimum* L.

E, Rest (MI)

Sea Knotgrass; Maltese: Lewża tal-Baħar]

Grows in sand-dune habitats. Steadily on the decline. May now persist only at Santa Marija Bay in Comino.

*Polygonum mite* Schrank

E, Rest (MI)

[Tasteless Water-pepper]

Recently discovered by M. Briffa at Għirgenti. Native status uncertain.

*Polygonum salicifolium* Broussonet ex Willdenow

V, Rest (MI)

[Willow-leaved Water-pepper]

Grows only along permanent springs. Restricted to just two stations in one of which it is a dominant component of the vegetation. The habitat of this station is, however, rapidly deteriorating.

Family: **C h e n o p o d i a c e a e**

*Atriplex rosea* L.  
[Rosy Orache]

X(?)

Used to grow in several seaside stations but not recorded for many years.

*Halimione portulacoides* (L.) Aellen  
(= *Atriplex portulacoides* L.)  
[Sea Purslane; Maltese: Bjanka tal-Bahar]

E, Rest (MI)

This species which grows in saline marshland and occasionally in sand and other saline habitats, has been steadily decreasing. The last remaining population in Malta seems to be that of the small Ras lċ-Ċagħaq promontory on the inner side of the Delimara peninsula, which site has now been taken up by the new power station. Several plants were transplanted to the Ghadira Nature Reserve and, at the time of writing, seem to have become fairly well established. Another, smaller, population persists at Wied il-Għasri in Gozo.

*Gremnophyton lanfrancoi* Brullo & Pavone  
[Maltese Cliff-Orache; Maltese: Bjanka ta' l-Irdum]

●, R, Rest (MI)

*Gremnophyton* is a newly described monotypic genus which seems related to the ancestors of *Atriplex* and *Halimione*. A relict species from the Tertiary flora of the region. Of considerable importance in understanding the evolution of an important group of plants. Restricted to sheer cliffs in SW Malta and W Gozo (including General's Rock). Formerly confused with *Halimione portulacoides* which it superficially resembles (Brullo & Pavone, 1987). Records of *Atriplex molle* Desfontaine, which are reviewed by Sommer & Caruana Gatto (1915), may possibly be ascribed to this species.

*Darniella melitensis* (Botschantzev) Brullo  
(= *Salsola melitensis* Botschantzev)  
[Maltese Salt-Tree; Maltese: Xebb, Sığra ta' l-Irmied]

●

A recently described shrub or small tree (Botschantzev, 1976; Brullo, 1984). The only European representative of the genus *Darniella*. While still quite abundant in its particular habitat, i.e. maritime cliffs and escarpments (in Gozo also inland), several fine populations have been and are being wiped out to make way for an assortment of development projects.

Family: **A i z o o a c e a e**

*Mesembryanthemum crystallinum* L.  
[Crystal-plant, Ice-plant; Maltese: Kristallina]

RR, Rest (MI)

Grows sporadically on low-lying seaside soils. Has been noted in about four stations. Native status doubtful.

Family: **C a r y o p y l i a c e a e**

*Paronychia argentea* Lamarck  
[Silvery Nailwort]

X(?)



Long extinct, the last authenticated record dating back to 1934 (Borg, 1935).

*Paronychia macrosepala* Boissier  
[Capitate Nailwort]

X(?), Rest (MED)

Last known population has been destroyed by the same changes which wiped out *Plantago albicans* (q.v.).

*Pteranthus dichotomus* Forskaal

X, Rest (MED)

No herbarium material seems to exist in order to substantiate the existence of this species in Malta which was first recorded by Grech Delicata (1853). It is however a distinctive species. A North African species extending to Asia Minor and the Middle East, also known from Spain.

*Polycarpon diphyllum* Cavanilles  
[Two-leaved Allseed]

I

Recently discovered in Gozo (Brullo, personal communication).

*Cerastium brachypetalum* Persoon  
[Grey Mouse-ear]

X(?)

Not recorded for many years.

*Cerastium ligusticum* Viviani  
[Large-flowered Mouse-ear]

X(?)

Not recorded for many years.

*Minuartia mediterranea* (Link) K. Maly  
[Mediterranean Sandwort]

X(?)

Not recorded for many years. Other species of *Minuartia*: *M. viscosa* (Schreber) Schinz & Thellung, and *M. hybrida* (Villars) Šiškin, have been recorded from the same localities, probably in confusion with the above.

*Agrostemma githago* L.  
[Corn Cockle]

X

Not recorded for many years. A weed of cornfields; rapidly disappearing throughout its range due to improved agricultural practices.

*Silene fruticosa* L.

E, Rest (MED+MI)

[Shrubby Campion, Woody Catchfly; Maltese: Lsien i-Qhasfur tal-Blat]

This very rare species occurs in just two small pockets in Gozo. Both stations are threatened by new building developments.

*Silene bellidifolia* Jussieu ex Jaquin.  
(= *S. vespertina* Retzius)  
[Dense-flowered Catchfly]

X(?), Rest (MED)

Not seen for many years.

*Silene behen* L.  
[Hairless Catchfly]

X(?)

Not recorded for many years.

**Family: Ranunculaceae**

*Anemone hortensis* L.  
[Broad-leaved Anemone; Maltese: Kahwiela Ġara]

X(?)

Not seen for many years.

*Delphinium staphysagria* L.  
[Stavesacre, Lousewort; Maltese: Żerrieghet il-Qamaj]

RR, Rest (MI)

Is now nearly extinct. Few remaining plants are doubtfully native since it appears to have been cultivated as a herbal remedy.

*Ranunculus bulbosus* L. subsp. *adscendens* (Brotero) Neves forma  
*macranthus* (Sommier & Caruana Gatto) Lanfranco, comb. nov. ●(?), X(?)  
[Bulbous Buttercup; Maltese: Ġfolloq ta' l-Ilma]

Basionym: *Ranunculus macrophyllus* Desf. forma *macranthus* Sommier & Caruana Gatto, *Flora Melitensis Nova*: 71; Firenze 1915.

Large flowered form described from Wied Inċita by Sommier & Caruana Gatto (1915) as a form of *R. macrophyllus* Desfontaines. May be extinct.

*Ranunculus chius* DC  
[Eastern Buttercup]

X(?)

Not recorded for many years.

*Ranunculus ophioglossifolius* Villars  
[Adder's Tongue Spearwort]

X(?)

Recently destroyed by alterations at Wied Mula (Għajn Rihana). An aquatic species. Records of *R. fontanus* Presl, an essentially highland species, may refer to this species.

*Ranunculus sardous* Crantz  
[Halcy Buttercup]

X(?)

Not recorded for many years.

*Ranunculus trilobus* Desfontaines  
[Three-lobed Buttercup]

X(?)

Not recorded for many years.

**Family: Hypericaceae (=Guttiferae, Clusiaceae)**

*Hypericum australe* Tenore  
[Southern St. John's Wort]

X(?), Rest (MED)

A western Mediterranean species. No material has been seen to substantiate the records but since it is quite easy to separate it from the other species of the genus, it is being given the benefit of the doubt. In the past it has often been confused with *H. humifusum* L. under which name it has featured in most Maltese floras.

*Triadenia aegyptica* (L.) Boissier

Rest (MED)

(= *Hypericum aegypticum* L.)

[Egyptian St. John's Wort; Maltese: Fexfiex ta' l-irdum]

Has a predominantly North African distribution. Is of considerable phytogeographical and phytosociological importance. It is an important component of the exclusively Maltese association *Triadenio-Chiliadenetum bocconeii* Brullo (Brullo & Marcenò, 1979).

# Family: Lauraceae

*Laurus nobilis* L.

R, Rest (MI)

[Bay Laurel; Maltese: Rand]

The Bay Laurel is a characteristic Mediterranean tree. Its status in Malta is complex since it appears to have been cultivated since at least classical times. Nevertheless its presence in Malta in the Late Quaternary has been established as evidenced by the discovery of subfossil leaves (Zammit Maempel, 1977). It presently occurs in a few maquis associations (e.g. Girgenti, Wied Qirda) as well as an undergrowth tree at Buskett. In every case it is not clear whether the extant populations were originally planted or not. At any rate, the Bay Laurel deserves protection as part of our Mediterranean cultural heritage.

# Family: Brassicaceae (= Cruciferae)

*Enarthrocarpus pterocarpus* (Persoon) DC.

E, Rest (MED+MI)

[Winged Radish]

A native of Libya and Egypt. It was the first noticed by J. Donaldson in 1877 (Guila, 1877). It is evidently an adventive which became naturalized in the Marsamxett Harbour area and now persists only at Manoel Island. Malta seems to be the only known European station. Has been included due to its restricted distribution. It features in Appendix 1 of the Berne Convention which includes strictly protected flora species (Council of Europe, 1979).

*Hymenolobus procumbens* (L.) Nuttall ex Torrey & A. Gray

subsp. *revelieri* (Jordan) Greuter & Burdet forma *sommieri*

(Pampanini) Lanfranco, comb. nov.

●(?), E, Rest (MED+MI)

Basionym: *Hutchinsia procubens* (L.) Desv. var. *revelieri* Jordan forma *sommieri* Pampanini, *Nuova Giorn. Bot. It.* 1909: 36-37, Firenze 1909.

This very rare plant seems to persist only at Comino where it was first found by Duthie in 1874 (Duthie, 1874). It was also found by Guila (Gavino) in the same year in Gozo. The Gozo records, however, have not been substantiated. This very small plant was believed extinct until

rediscovered in its original locality in 1986. The Maltese plants have been described as *f. sommieri* Pampanini, but the taxonomic standing of this form has to be established.

*Erophila verna* (L.) Chevallier  
[Common Whitlow Grass]

X(?)

A very small plant which has not been recorded for several decades.

*Matthiola incana* (L.) R. Brown subsp. *melitensis* Brullo, Lanfranco,  
Pavone & Ronsisvalle  
[Maltese Stock; Maltese: Ġiżi ta' Malta]

●, R

This endemic subspecies has only recently been described (Brullo *et al.*, 1988). It grows on cliffs overhanging the sea. Occurs in several localities in Gozo but seems to be confined to just one area of Malta (Rdum Rxawn to Rdum il-Bies). There are slight differences between the Maltese and the Gozitan populations. *Matthiola incana* subsp. *incana*, the Common Stock (Maltese: Ġiżi) is commonly cultivated in many forms and is naturalized on the fortifications of the Marsamxett area (Tigné, Manoel Island, Valetta).

*Matthiola lunata* DC.  
[Spanish Stock; Maltese: Ġiżi ta' Spanja]

X(?), Rest (MED)

This annual Stock was discovered by Guido Lanfranco at Dwejra (Gozo) in 1957. It has not been met with again since the original discovery. Occurs in Spain and western North Africa.

*Neslia apiculata* Fisher, Mayer & Avé-Lallemont

R, Rest (MI)

Records suggests that this species was once frequent. It has now become a rare plant. In all Maltese floras it has been recorded erroneously as *N. paniculata* (L.) Desvaux.

*Thlaspi perfoliatum* L.  
[Perfoliate Penny-cress]

X(?)

Not recorded for many decades.

## Family: Crassulaceae

*Crassula tillaea* Lester-Garland  
(= *C. muscosa* (L.) Roth; *Tillaea muscosa* L.)  
[Mossy Stonecrop, Mossy Redshanks]

R, Rest (MI)

Records suggest that this rare plant was once quite frequent.

*Sedum caeruleum* L.  
[Blue Stonecrop; Maltese: Beżżul il-Baqra]

Rest (MED)

This attractive common species is included here because of its restricted Mediterranean distribution and phytogeographical interest. It is a western species occurring in the Maghreb countries and Sardinia, Corsica and Sicily in addition to Malta.



*Sedum caespitosum* (Cavanilles) DC.  
[Caespitose Stonecrop; Maltese: Beżżul il-Baqra Żghira]

RR, Rest (MI)

Restricted to a few cliff-top rocky stations.

*Sedum litoreum* Gussone  
[Sea Stonecrop; Maltese: Beżżul il-Baqra Safral]

R, Rest (MI)

Restricted to a few rocky seaside stations.

*Sedum stellatum* L.  
[Starry Stonecrop]

X(?)

Not recorded for many decades.

*Sedum album* L.  
[White Stonecrop; Maltese: Beżżul il-Baqra Bajdal]

RR, Rest (MI)

Confined to the rocks on top of Dingli Cliffs. Not previously recorded in any flora but records of *S. dasyphyllum* L. which appear in various floras should probably be ascribed to this species, especially since it has been recorded from the same localities.

#### Family: Saxifragaceae

*Saxifraga tridactylites* L.  
[Rue-leaved Saxifrage]

X(?)

This very small plant, our only representative of the family, was first recorded by John Borg from the Żebbuġ side of Wied Inċita (Borg, 1927). However I located some herbarium material of this species, mixed up with *Erophila verna* (L.) Chevallier, which it superficially resembles, collected from l-Ingiered by Alfred Caruana-Gatto. Although undated, the material was probably collected between 1910 and 1915 since l-Ingiered is cited as a confirmed locality for *Erophila verna* by Sommer & Caruana Gatto (1915).

#### Family: Rosaceae

*Crataegus azarolus* L.  
[Azarole; Maltese: Anżalor]

R, Rest (MI)

It is difficult to decide whether the plants which are extant are truly native since this species has also been cultivated for its fruit. Our plants may actually be *C. x ruscifonensis* Grenier & Blanc which is a hybrid between *C. azarolus* and the Hawthorn (Maltese: Żagħrun, Anżalor Salvagg), *C. monogyna* Jacquin which is fairly frequent.

*Mespilus germanica* L.  
[Medlar; Maltese: Fomm il-Lipp]

X(?)

Used to grow wild in Gozo but not seen for several decades. Its native status is doubtful since it might also have been grown for its fruit.

*Pyrus amygdaliformis* Villars  
[Almond-leaved Pear; Maltese: Langas Salvagg]

E, Rest (MI)

Maltese populations have dwindled to one small copse at the bottom of Wied Żembaq (Birżebbuġa). Another small population which may be referable to this species was located at Wied Maqbul early in 1988 by Albert Caruana. Suckers from wild trees have been (and are still) used as stock for grafting pears.

*Rosa sempervirens* L.

V, Rest (MI)

[Evergreen Rose; Maltese: Girlanda tal-Wied]

Only a few populations still persist at Wied Inċita, Wied Anglu, Rđum Dikkiena, Santa Katarina and Ta' Baldu.

*Rubus caesius* L.

X(?)

[Dewberry; Maltese: Gholluq Abjad]

Not recorded for several decades. Most records are from Gozo.

*Sorbus aucuparia* L.

X(?)

[Rowan, Mountain Ash; Maltese: Żorba Salvagga]

Only recorded by Borg (1927). Has not been recorded since.

*Sarcopoterium spinosum* (L.) Spach

E, Rest (MED+MI)

[Thorny Burnet; Maltese: Tursin il-Għul Xewwleki]

Recently recorded by Briffa (1986) from Pembroke. The very small population, which is endangered by new buildings, is characteristic of the eastern Mediterranean phrygana community and may represent such a relict community.

Family: **F a b a c e a e** (= Leguminosae)

*Anagyris foetida* L.

RR, Rest (MI)

[Bean Trefoil; Maltese: Fula tal-Klieb]

Only a few populations of this rare shrub still exist.

*Coronilla emerus* L.

X(?)

[Pale Crown-vetch, Scorpion Senna; Maltese: Koronilla Kbira]

Seems to have disappeared from the wild. Some records may be due to confusion with *Coronilla valentina* L., the Common Crown-vetch (Maltese: Koronilla), an uncommon shrub which occurs in some stations cited for this species. Also cultivated in public places, especially in Gozo. It can easily be employed in afforestation projects.

*Hedysarum spinosissimum* L.

V, Rest (MED+MI)

[Spiny Silla; Maltese: Silla ta' Kemmunal]

Occurs only on Comino where it grows on rocky ground close to the sea. Seaside developments may seriously endanger its existence. A western Mediterranean element.

*Hymenocarpus circinnatus* (L.) Savt

V, Rest (MI)

[Maltese: Neiel t'Għawdex]

Found only on Gozo where it has been steadily decreasing mainly due to modification of its habitat.

*Lathyrus amphicarpos* L. E, Rest (MED+MI)  
[Four-winged Pea; Maltese: Ċikkarda tal-Blat]

Not previously recorded. First found at Ta' Żuta in 1980. A species with a fragmentary Mediterranean distribution. Endangered by the extensive degradation which is taking place in its habitat.

*Lathyrus annuus* L. RR, Rest (MI)  
[Annual Pea; Maltese: Ċikkarda Kbira]

*Lathyrus gorgoni* Parlatores X(?), Rest (MED)  
[Rare Pea; Maltese: Ċikkarda Safra]

Not seen for several years.

*Lathyrus inconspicuus* L. X(?)  
[Solitary-flowered Pea; Maltese: Ċikkarda Rqiqal]

*Lathyrus setifolius* L. X(?)  
[Red Pea; Maltese: Ċikkarda tal-Weraq Dojoq]

*Lathyrus sphaericus* Retzius RR, Rest (MI)  
[Round Pea; Maltese: Ċikkarda Żgħira]

*Lotus preslii* Tenore R, Rest (MI)  
[Bird's-Foot Trefoil; Maltese: Ghantux]

According to Sommier & Caruana Gatto (1915) this plant was fairly frequent in humid places. It has now become very restricted and seems to persist only in the Mistra valley.

*Ononis biflora* Desfontaines R, Rest (MI)  
[Two-flowered Restharrow]

*Ononis oligophylla* Tenore X(?), Rest (MED)  
[Few-leaved Restharrow]

Recorded only from Gozo (Sommier & Caruana Gatto, 1915). Not seen for many decades. Outside the Maltese Islands occurs only in South Italy and Sicily.

*Ononis variegata* L. E, Rest (MI)  
[Sand Restharrow]

Confined to the sandy bay of Ramla l-Hamra in Gozo, an important sand dune habitat which is endangered by touristic development.

*Medicago arabica* (L.) Hudson RR, Rest (MI)  
[Spotted Medick; Maltese: Nefel tal-Tikek]

Grows sporadically in seaside habitats.

*Medicago marina* L. V, Rest (MI)  
[Sea Medick; Maltese: Nefel tar-Ramej]



Populations have been steadily declining due to the degradation of sand dunes. Now confined to the Mellieha Bay (Malta) and Ramla l-Mamra (Gozo) dunes.

*Medicago murex* Willdenow R, Rest (MI)  
[Spiny Medick; Maltese: Nefel Skars]

*Trifolium lappaceum* L. RR, Rest (MI)  
[Bur Clover; Maltese: Xnien Xewwieki]

*Trifolium squamosum* L. RR, Rest (MI)  
(= *T. maritimum* Hudson)  
[Sea Clover; Maltese: Xnien tal-Baħar]

*Trifolium squarrosum* L. RR, Rest (MI)  
Squarrose Clover; Maltese: Xnien tal-Iimal

*Trifolium subterraneum* L. X(?)  
[Subterranean Clover; Maltese: Xnien Midfun]

Not seen for about a century. The only critically authenticated records are those of Armitage who was in Malta in 1888/89 and 1891 (Sommier & Caruana Gatto, 1915) and of Duthie (1875b). All these specimens belong to the variety *longipes* Gay.

*Spartium junceum* L. E, Rest (MI)  
[Spanish Broom; Maltese: Ġenista Safran]

Only a handful of wild shrubs still exist. Sometimes cultivated in public places. An ideal choice for afforestation schemes.

*Vicia bithynica* (L.) L. E, Rest (MI)  
[Bithynian Vetch; Maltese: Ġilbiena Moxnal]

Found only at Għajn il-Kbira (Girgenti) where it is endangered by habitat degradation.

#### Family: Geraniaceae

*Erodium alnifolium* Gussone X(?), Rest (MED)  
[Alder-leaved Storksbill]

A species confined to northern West Africa, Sardinia, Sicily and southern Italy. It was recorded from the Għajn Rihana Valley (Wied Mula) (Lanfranco, 1972). Became extinct some years after its discovery owing to habitat disturbance.

*Erodium cicutarium* (L.) Willdenow R  
[Mediterranean Storksbill]

Old records of this species are not reliable; however there is a recent record from Wied Marsalforn (Gozo) (Kramer et al., 1972).

*Erodium laciniatum* (Cavanilles) Willdenow V  
[Sand Storksbill, Cut-leaved Storksbill]

Confined to sandy habitats at Mellieha Bay, Ramla tat-Torri and Ramla i-Mamra (Gozo). Gozo plants are somewhat different from those found in Malta. Populations have been fast declining due to habitat disturbance.

Family: *Zygophyllaceae*

*Fagonia cretica* L.

V, Rest (MED+MI)

[Fagonia; Maltese: Fagonja]

A rare decorative shrub associated with clay substrata in the Ġnejna area. Populations are decreasing due to habitat disturbance. Recently found also at Rdum Majjesa. Restricted to the South Mediterranean but occurring outside the Mediterranean in several tropical/subtropical areas.

Family: *Linaceae*

*Linum bienne* Miller

RR, Rest (MI)

[Pale Flax; Maltese: Kittien Salvagg]

A very rare delicate plant now restricted to Selmun and Qala Santa Marija (Comino).

*Linum decumbens* Desfontaines

X, Rest (MED)

[Red Flax; Maltese: Kittien Ahmar]

Used to grow only at Ghajn Żejtuna (now largely occupied by the Santa Marija Estate, Mellieha). Has been extinct for several years.

Family: *Euphorbiaceae*

*Euphorbia characias* L.

RR, Rest (MED+MI)

[Large Spurge; Maltese: Tenguħ tal-Ħaġar]

Literature records suggest that this species was, until fairly recently, quite frequent. Now, however, it is a very rare species confined to places with loose stones in the vicinity of Buskett and Mtarfa and a few places in Gozo. Maltese plants show some similarity with *E. melapetala* Gasparrini which is a Sicilian endemic of uncertain taxonomic status.

*Euphorbia exigua* L. var. *pycnophylla* Kramer & Westra Rest (MED)

[Maltese Dwarf Spurge; Maltese: Tenguħ Inq ta' Malta]

This was first described by Kramer *et al.* (1972) from the Maltese Islands. Recently it has been discovered on the island of Lampedusa (Minissale & Spampinato, 1987) and may thus represent a Pelago-Maltese endemism. It is fairly frequent on exposed rocky ground close to the sea in western Malta, on Gozo and on Comino.

(\*) *Euphorbia melitensis* Parlato

[Maltese Spurge; Maltese: Tenguħ tax-Xaġhr]

The exact status of this spurge has been a matter of considerable debate. In most Maltese floras (Sommier & Caruana Gatto, 1915; Borg,

1927; Haslam et al., 1977) it has been regarded as synonymous with *E. spinosa* L. However, it is certainly much more closely related to *E. bivonae* Steudel var. *papillaris* (Jan) Boissier which has been recorded separately by various authors. It appears indeed that the difference between *E. melitensis* and *E. bivonae* var. *papillaris* is very slight and the two taxa may either be identical or geographical races of the same species. A study on this group of spurges was carried out by Cesca (1969).

*Euphorbia paralias* L. E, Rest (MI)  
[Sea Spurge; Maltese: Tengehud tar-Rameil]

Sommier & Caruana Gatto (1915) record this species from Ġnejna, San Tumas, Marfa Peninsula, from Ramla (Gozo) and from Comino. Earlier still it also existed at Salini (Grech Delicata, 1853). Until about 1965, I knew this species from Mellieha Bay, Ramla tat-Torri and Ramla l-Mamra (Gozo). Now it only exists at Ramla l-Mamra! This is the fate which seems to be reserved for most dune plants.

*Euphorbia pepiis* L. E, Rest (MI)  
[Purple Spurge; Maltese: Ġemmugħa tar-Rameil]

This is another fast declining sand dune species. Persists, in ever decreasing quantity at Mellieha Bay and Ramla l-Mamra (Gozo).

*Euphorbia pubescens* Vahl X  
[Hairy Spurge; Maltese: Tengehud Muswaf]

Still existed at Ġnien il-Kbir up to the first decade of this century. Sommier & Caruana Gatto (1918) already comment on its possible disappearance from this locality due to habitat disturbance. A plant associated with watercourses.

*Euphorbia terracina* L. V, Rest (MI)  
[Coast Spurge; Maltese: Tengehud tax-Xatt]

A species associated with sand dunes and like other dune species is in considerable danger. A discrete population still exists at Mellieha Bay.

#### Family: A n a c a r d i a c e a e

*Rhus coriaria* L. E, Rest (MI)  
[Sumach; Maltese: Xumakk tal-Konz]

Only one small population, in a very vulnerable area, still persists (Wied Hesri). The population which occurred "in discreta quantitate" at Wied Żnuber (Sommier & Caruana Gatto, 1915) no longer exists.

#### Family: R h a m n a c e a e

*Paliurus spina-christii* Miller E, Rest (MI)  
[Christ's Thorn; Maltese: Xewk tal-Kuruna, Xewk ta' Kristul]

Exists in just a couple of specimens at Wied Xiendi in Gozo. Should be a good candidate for afforestation!

Family: **M a l v a c e a e**

*Malope malachoides* L. X(?)  
[Hairy Mallow; Maltese: Hobbejża Muswafal]

Used to occur in several humid localities (Sommier & Caruana Gatto, 1915) but now seems to have disappeared.

*Althaea hirsuta* L. RR, Rest (MI)  
[Hispid Marsh-mallow; Maltese: Hobbejża Sufija]

Used to occur in several localities but now seems to be restricted to Comino, especially in the Qala Santa Marija area.

Family: **V i o l a c e a e**

*Viola odorata* L. X(?)  
[Sweet Violet; Maltese: Vjola]

Seems to have disappeared from native stations such as Imtahleb and Ġnejna. Also cultivated and sometimes naturalized in gardens.

*Viola parvula* Tineo X(?)  
[Rock Pansy; Maltese: Vjola Żgħira, Pensjeri Salvagġal]

Not seen for several decades.

Family: **C i s t a c e a e**

*Cistus creticus* L. subsp. *creticus* & subsp. *eriocephalus*  
(Viviani) Greuter & Burdet R, Rest (MI)  
[Hoary Rockrose; Maltese: Ċistu Rosa]

Usually recorded as "*C. incanus*". The form usually met with is the subspecies *eriocephalus* which occurs mainly in NW Malta while the subspecies *creticus* seems to be confined to the Ta' Baldu/Wied Mażrun area.

*Cistus monspeliensis* L. RR, Rest (MI)  
[White Rockrose; Maltese: Ċistu Abjad]

Two large populations exist: one in Gozo at Wied Bingemma/Wied Ir-Rihan and one in Malta (recently discovered by Michael Briffa) at the Wied Rini area close to Imtahleb. Possibly representative of a low maquis which may have characterised the Maltese Islands before extensive degradation by human agency took place.

Family: **T a m a r i c a c e a e**

*Tamarix africana* Poiret R, Rest (MED+MI)  
[African Tamarisk; Maltese: Bruka]

While commonly cultivated in coastal localities, the African Tamarisk is a true native. As a native tree its range is now restricted to parts of

Gozo (e.g. San Blas). The populations at Qala Santa Marija (Comino) and Imġiebah (Malta) may also be native. Should not be confused with other Tamarisks which are often cultivated with it e.g. *T. gallica* L. and *T. parviflora* DC.

**Family: E l a t i n a c e a e**

*Elatine gussonei* (Sommier) Brullo, Lanfranco, Pavone & Ronsisvalle  
[Maltese Waterwort; Maltese: Elatine] R, Rest (MED+MI)

A Pelago-Maltese endemic confined to the Maltese Islands and Lampedusa. Related to *E. hydropiper* L. and *E. macropoda* Gussone, under which names it has usually been recorded.

**Family: M y r t a c e a e**

*Myrtus communis* L. V, Rest (MI)  
[Myrtle; Maltese: Riĥan]

One of the trees most characteristic of the Mediterranean maquis, it is nevertheless a rare plant and its populations seem to have declined considerably. Evidence that the Myrtle was more widespread are various toponyms such as Għajn Riĥana and Wied ir-Riĥan. It is now confined to a few localities such as Gġirgenti, San Martin, Ġnien Ingraw (Mellieħa) and Wied Gerżuma.

**Family: C y n o m o r i a c e a e (= Balanophoraceae p.p.)**

*Cynomorium coccineum* L. E, Rest (MED+MI)  
[Malta Fungus; Maltese: Għerq Sinjur, Għerq il-Ġeneral]

This is the famous "Malta Fungus" of great historical interest (Lanfranco, 1961). In spite of its common name and of the fact that the islet on which it grows is often called "Fungus Rock", it is actually a parasitic flowering plant and is completely unrelated to the true fungi. Seems to exist only on Maġret il-Ġeneral (General's Rock) near Dwejra (Gozo). There are a few records from mainland sites but it appears to have disappeared from such places. Outside Malta it occurs throughout the Mediterranean, Irano-Turanian and Macaronesian regions but is nowhere common.

**Family: A p l a c e a e (=Umbelliferae)**

*Bifora testiculata* (L.) Roth X(?)  
[Mediterranean Bifora; Maltese: Kosbor Salvagg, Sorm il-Patri, Bumnieħer]

A plant associated with cereal crops. Used to be fairly frequent especially in western Malta; the variety of Maltese names also indicates that it was a reasonably familiar plant. It has not been seen for several decades.





(a) The Sandarac Gum Tree, *Tetraclinis articulata*, is one of the rarest trees in Europe. (Photo: E. Lanfranco).



(b) In the Maltese Islands the Wild Tulip, *Tulipa sylvestris*, is confined to a single fallow field. (Photo: E. Lanfranco).

**Plate I.**

*Bupleurum semicompositum* L.

E, Rest (MI)

[Grey Hare's-ear; Maltese: Widnet il-Fenek Irqija]

This very rare plant is now confined to the Rdum tal-Madonna (Marfa Peninsula). Until recently it used to occur at the Citadel (Gozo) but has been destroyed by works carried out there (Lanfranco, 1981).

*Capnophyllum peregrinum* (L.) Lange

X(?)

(= *Kruberia peregrina* (L.) Lowe)

Used to grow in the Ghajn Rihana area (Borg, 1927) but seems to have disappeared.

(\*) *Daucus lopadusanus* Tineo

I, Rest (MED)

[Lampedusa Carrot; Maltese: Zunnarija tal-Blat]

A Pelago-Maltese endemic confined to the Maltese Islands and Lampedusa. Although quite distinctive it is of uncertain status and may be only a local variant of *D. carota* L. It has so far been found on the Maria Peninsula and Comino but may occur elsewhere.

(\*) *Daucus rupestris* Gussone

Rest (MED+MI)

[Cliff Carrot; Maltese: Zunnarija ta' l-Irdum]

Sub-endemism confined to the Maltese Islands, and the islands of Lampedusa and Lampione (Pelagian Isles) and Panarea (Eolian Isles). Quite common on cliffs but requires further investigation since it is easily confused with the Sea Carrot (Maltese: Zunnarija tal-Baħar), *D. gingidium* L.

*Echinophora spinosa* L.

E, Rest (MI)

[Maltese: Busbież Xewwieki tar-Ramell]

Now confined to Ramla l-Mamra (Gozo). Until very recently existed also at Ramla tat-Torri but has been destroyed by the extensive habitat disturbance associated with this site.

*Eryngium maritimum* L.

V, Rest (MI)

[Sea Holly; Maltese: Xewk tar-Ramell]

Confined to a few of the existing sand dunes, but, like all sand dune flora, in rapid decline.

*Pseudorhiza pumila* (L.) Grande

E, Rest (MI)

(= *Daucus pumilus* (L.) Hoffmannsegg & Link = *Orlaya maritima* (L.) Koch)

[Sand Carrot; Maltese: Zunnarija tar-Ramell]

Seems to be confined to Ramla l-Mamra (Gozo) where it is rare. Within the last ten years it also occurred at Mellieħa Bay and Ramla tat-Torri from where it has disappeared due to extensive habitat disturbance.

#### Family: *Plumbaginaceae*

This family is represented in Malta by two genera: *Plumbago* and *Limonium*, the latter being of considerable interest. In the literature



several species of *Limonium* have been recorded, but they are mostly based on misidentifications resulting from an attempt to correlate the Maltese species with those known from the continent. The reason for this confusion is that in truth the Maltese species are, with one exception, endemic. Maltese representatives of the genus are being studied closely and it appears that we have at least five different entities of which two are still unnamed. Species of *Limonium* are known in Maltese as "Lebjet ix-Xiġ", this name, however, is also applied to the Mediterranean Heath *Erica multiflora* L. (family: Ericaceae). In order to avoid confusion I suggest using the term "Limonju".

*Limonium melitensis* Brullo

(Maltese Sea-lavender; Maltese: Limonju ta' Malta)

This seems to be the commonest of our Sea-lavenders, although it has only been described very recently (Brullo, 1988). It is likely that records of *L. cosyrense* (Gussone) O. Kuntze (*Statice cosyrensis* Gussone) actually refer to this species. Sommier & Caruana Gatto (1915), while accepting *Statice cosyrensis*, cite the Maltese specimens as a new variety to which they give the name *melitensis*; *L. cosyrensis* is endemic to Pantelleria. *Limonium melitensis* grows mainly on cliffs and occasionally on low-lying coastal rocks, clays and saline marshlands.

*Limonium virgatum* (Willdenow) Fourreau

R. Rest (MI)

(= *Limonium oleifolium* sensu Pignatti non Miller = *Statice virgata* Willdenow)

(Seaside Sea-lavender; Maltese: Limonju tal-Bahari)

Our only non-endemic Sea-lavender. Mainly found in low-lying coastal habitats including saline marshlands (e.g. Marsaxlokk, Qaliet) and rocks (e.g. Sliema). The var. *maius* (Gussone) Pignatti (= *Statice dubia* Andrews ex Gussone) is also met with.

*Limonium zeraphae* Brullo

©, R. Rest (MI)

(Zerafa's Sea-lavender; Maltese: Limonju ta' Zerafa)

Seems confined to low-lying coastal rocks along the northern Maltese seaboard. Recorded in the Maltese floras as *Statice reticulata* L. which is an ambiguous name (Brullo, 1980).

*Limonium* sp. nov.

©, E. Rest (MI)

Was discovered at Ras lċ-Ċagħaq, a small saline marsh at Delimara, in February 1988. Unfortunately the site happens to be right in the middle of the new power station under construction. In order to prevent its total obliteration, several specimens were transplanted onto one of the islets in the pool of the Ghadira Nature Reserve which have a similar habitat. The specimens transplanted have survived and in fact they have flowered and fruited. It remains to be seen whether they will also propagate.

A fifth entity of the genus appears to be of hybrid origin (Brullo, personal communication). It is confined to Qaliet (St. Julians).

Family: Oleaceae

*Olea europaea* L.  
[Olive; Maltese: Żebbuġ]

Rest (MI) (?)

Most olive populations in the Maltese Islands are of cultivated origin even though often found naturalized. The true wild olive (*var. sylvestris* Brotero = *O. oleaster* Hoffmannsegg & Link), although not common, is quite often met with. Archaeological evidence suggests that the Olive existed in the Maltese Islands even during the Tarrhen Phase (e.g. Metcalfe, 1966). A small grove of ancient olives exists at Bidnija. These olives are certainly several hundred years old and should be accorded special protection.

Family: Asclepiadaceae

*Periploca laevigata* Aiton subsp. *angustifolia* (Labillardiere)  
Markgraf Rest (MED)  
[Wolfbane; Maltese: Siġret il-Marir]

Although not quite rare, this is not by any means a common plant. It occurs sporadically in rupestral habitats. It is essentially a North African species. The typical form is Macaronesian. Represents a Tertiary relict species of the Mediterranean.

Family: Rubiaceae

*Crucianella rupestris* Gussone Rest (MED)  
Rock Crosswort; Maltese: Kruċanella

Confined to rupestral habitats and low-lying coastal rocks. This distinctive shrublet has a mainly eastern North African distribution. Until recently the only European stations were the Maltese Islands and Lampedusa until it was also discovered at a site close to Scoglitti (Ragusa province) in Sicily (Brullo & Marcenò, 1973).

*Putoria calabrica* (L.) V. Rest (MED+MI)  
[Stinking Madder; Maltese: Putorja]

This very rare plant was until recently known only from Wied il-Għasel. In the 1960s populations were discovered at Selmun and at two sites in Comino. All populations are vulnerable due to their vicinity to areas which are being developed. The Wied il-Għasel population is somewhat different from the others so that it is possible that two entities are involved. Closer investigation is however required.

*Valantia hispida* L. X(?), Rest (MED+MI)  
[Hairy Valantia]

The only authenticated record is that of Duthie (1874) who also claims to have seen it on Cominotto.

Family: Convolvulaceae

*Calystegia soldanella* (L.) R. Brown

[Sea Bindweed; Maltese: Leblieb tar-Ramej]

Used to occur at Ramla tar-Torri but long extinct.

*Calystegia x lucana* (Tenore) G. Don

(= *C. sepium* (L.) R. Brown x *C. sylvestris* (Kitabel) Grisebach)

[Hybrid Bindweed; Maltese: Kampanella Salvaġġa]

This hybrid has usually been recorded as either or both of its parent

species. Examination of Maltese material, however, revealed that only

the hybrid seems to be present, although it cannot be excluded that

either or both parents used to grow wild in Malta (Lanfranco, 1973).

Found only at Buskett and Msida Valley. The Buskett plants were

destroyed in the late seventies as part of the Buskett management

policy. This year it has been noticed that some regeneration is taking

place in a different part of the valley.

*Convolvulus cantabrica* L.

[Southern Bindweed; Maltese: Leblieb Skars]

Very rare in the Mtieb/Wied Rini area. Recently also found at Fiddien.

*Convolvulus olifolius* Desrousseaux

[Olive-leaved Bindweed; Maltese: Leblieb ta' l-Irdum]

A species of considerable phytogeographical interest. It is essentially

a species of the eastern Aegean and the Middle East. Malta is the

westernmost locality where it occurs. The next nearest locality is Crete

where it is present in a population which has been distinguished under a

different name, *C. argyrophthalmos* Greuter. It will be useful to compare

populations from different areas of the Mediterranean to establish

whether the Maltese plants are actually identical to those of other

countries.

*Convolvulus tricolor* L. subsp. *cupanifolius* (Todaro) Cavanilles &

Grande

[Blue Bindweed; Maltese: Leblieb Ikhal]

Essentially a western North African subspecies with Sicily and Malta as

its only native European stations. Subsp. *tricolor* is sometimes

cultivated and is occasionally spontaneous.

*Cressa cretica* L.

[Maltese: Kressa]

Confined to some saline marshlands e.g. Ghadira, Salini, Ghadira s-

Safra, Qalet (St. Julian's).

Family: Boraginaceae

*Echium plantagineum* L.

(= *E. lycopsidis* L. p.p.)

[Purple Viper's-bugloss; Maltese: Lsien li-Fart Vjoja]

E, Rest (MED)

The few populations of this species have become seriously depleted and may perhaps have disappeared already.

*Heliotropium supinum* L.

X(?)

[Dwarf Heliotrope; Maltese: Ghobbejra Muswafa]

Has not been seen for many decades.

*Neotostema apulum* (L.) L.M. Johnston

RR, Rest (MI)

[Yellow Gromwell]

Populations have been steadily decreasing.

#### Family: Verbenaceae

*Vitex agnus-castus* L.

R, Rest (MI)

[Chaste Tree; Maltese: Sığra tal-Virgi, Ghadiba, Virga, Bżar tal-Patrijiet]

A small attractive tree or large shrub. Not uncommon in Gozo but rare in Malta. Gozo populations have been depleted due to 'valley clearing' operations. A suitable species for planting in marshy areas close to the sea since it tolerates high salinities.

#### Family: Callitricaceae

*Callitriche truncata* Gussone

R, Rest (MI)

[Southern Water-starwort]

Occurs in pools on rocky ground. Several other species of *Callitriche* have been recorded by Gulia (1872) but these have never been confirmed.

#### Family: Lamiaceae

*Coridothymus capitatus* (L.) Reichenbach fil.

(= *Thymus capitatus* L.)

[Mediterranean Thyme; Maltese: Saġhtar]

The Mediterranean Thyme is being included because it is one of the most important floristic elements of the Maltese Islands, being often the dominant shrub of the Maltese garigues (xaghri). Nevertheless its populations are on the decline as a result of habitat alteration, development and picking. It should be noted that due to its importance as a source of honey it is legally protected (Government Notice 85, 1932).

*Micromeria graeca* (L.) Bentham subsp. *tenuifolia* (Tenore) Nyman

(= *Satureja graeca* L. subsp. *tenuifolia* (Tenore) Arcangelii)

R, Rest (MED+MI)

[Greek Savory; Maltese: Saġħtrija Griega]

First recorded by Grech-Delicata (1853) whose records could not be confirmed. In 1985 a discrete population was encountered by the author at Wied Dalam in an olive grove. However, enquiries made by M. Briffa suggest



that the plants at Wied Dalam might have been imported accidentally with soil from Sicily from whence the olive trees were introduced (M. Briffa personal communication).

*Micromeria microphylla* (D'Urville) Benth. Rest (MED)  
(= *Satureja microphylla* (D'Urville) Gussone  
[Maltese Savory; Maltese: Xpakkapjeta, Sagħtrija])

Restricted to Malta, Sicily and the region of Puglia in Italy. Related to a number of Aegean and Middle Eastern species. In Malta it is fairly frequent. Well known in folk medicine.

*Mentha aquatica* L. X(?)  
[Water Mint; Maltese: Nagniegħ taż-Zwiegol]

Used to exist at Marsa and Buskett but has not been seen for many decades.

*Mentha suaveolens* Ehrhart X(?)  
[Round-leaved Mint; Maltese: Nagniegħ Salvagħ]

Used to grow at Buskett and Ġnien il-Kbir but not seen for many decades.

*Phlomis fruticosa* L.  
[Great Sage; Maltese: Salvja tal-Madonna, Salvjun]

An uncommon decorative shrub restricted to habitats transitional between garigue and maquis. Included here because of its important role in characterizing certain vegetational communities and because many of its haunts are giving way to quarries and new housing estates.

*Rosmarinus officinalis* L. R, Rest (MI)  
[Rosemary; Maltese: Klin]

A large shrub characterizing certain types of low maquis communities of valley sides (e.g. Wied Babu) and screes (e.g. Rdum Dikkiana).

*Salvia fruticosa* Miller E, Rest (MI)  
(= *S. triloba* L. fil.)  
[Three-lobed Sage; Maltese: Salvja]

On the verge of extinction probably due to constant collection. Less than handful of shrubs still exist on rocky ground close to Buskett. Also cultivated as a culinary herb. Records of *S. officinalis* L. in the wild should probably be referred to this species.

*Stachys ocymastrum* (L.) Briquet R, Rest (MI)  
(= *S. hirta* L.)  
[Hairy Woundwort]

Rare in Malta. Less so in Gozo.

*Teucrium scordium* L. subsp. *scordioides* (Schreber) Arcangelii E, Rest (MI)  
[Water Germander]

Used to occur along several watercourses (Sommer & Caruana Gatto, 1915 but eventually seems to have become restricted to the watercourse at Bahrija. The small population existing here was recently severely damaged.



by run off containing excessive herbicide as well as by continuous interference with its habitat. Has not been seen for a few years and may be already extinct.

Family: *Solanaceae*

*Lycium intricatum* Boissier R, Rest (MED+MI)  
[Southern Tea-tree; Maltese: Ghawseg]

This rare shrub has featured in all published Maltese floras (e.g. Sommier & Caruana Gatto, 1915; Borg, 1927; Haslam *et al.*, 1977) as *L. europaeum* L. which is actually a different species.

Family: *Scrophulariaceae*

*Verbascum creticum* (L.) Cavanilles RR, Rest (MED+MI)  
(= *Celsia cretica* L.)  
[Glandular Mullein; Maltese: Xatbet l-Andar Kbiri]

Always rare, seems to be steadily decreasing.

*Linaria pseudolaxiflora* Lojacard R, Rest (MED+MI)  
[Maltese Toadflax; Maltese: Papocci ta' Malta]

A Pelago-Maltese endemic restricted to Malta, Lampedusa and Linosa. Very rare in Malta, less so in Gozo.

*Kickxia elatine* (L.) Dumortier RR, Rest (MI)  
[Sharp-leaved Fluellin; Maltese: Xatbet l-Art Skarsi]

Seems to have become much rarer than literature references indicate. Maltese plants seem to belong to the subsp. *crinifolia* (Mabille) Greuter (= *Linaria sieberi* Reichenbach)

*Scrophularia auriculata* L. E, Rest (MI)  
[Water Figwort; Maltese: Fiswet il-Keib tal-lima, Werqa tal-Madonna]

Now confined to the watercourse at Batrija. Its population has been steadily decreasing as a result of the constant disturbance to its habitat.

Family: *Orobanchaceae*

*Orobanche cernua* Loeffling RR, Rest (MI)  
[Drooping Broomrape; Maltese: Budebbus tax-Xatti]

A rare species confined to low-lying coastal habitats.

*Orobanche clausonisi* Pomei X(?), Rest (MED)  
[Glandular Broomrape; Maltese: Budebbus ta' San Pawl]

The first and only record is that of Sommier & Caruana Gatto (1915). A species confined to the extreme western Mediterranean. The Maltese plants were attributed to the form *parviflora* Beck.

that the plants at Wied Dalam might have been imported accidentally with soil from Sicily from whence the olive trees were introduced (M.Briffa, personal communication).

*Micromeria microphylla* (D'Urville)Bentham Rest (MED)  
(= *Satureja microphylla* (D'Urville)Gussone  
[Maltese Savory; Maltese: Xpakkapjetra, Sagħtrija]

Restricted to Malta, Sicily and the region of Puglia in Italy. Related to a number of Aegean and Middle Eastern species. In Malta it is fairly frequent. Well known in folk medicine.

*Mentha aquatica* L. X(?)  
[Water Mint; Maltese: Nagniegħ taż-Zwiemej]

Used to exist at Marsa and Buskett but has not been seen for many decades.

*Mentha suaveolens* Ehrhart X(?)  
[Round-leaved Mint; Maltese: Nagniegħ Salvagg]

Used to grow at Buskett and Ġnien il-Kbir but not seen for many decades.

*Phlomis fruticosa* L.  
[Great Sage; Maltese: Salvja tal-Madonna, Salvjun]

An uncommon decorative shrub restricted to habitats transitional between garigue and maquis. Included here because of its important role in characterizing certain vegetational communities and because many of its haunts are giving way to quarries and new housing estates.

*Rosmarinus officinalis* L. R, Rest (MI)  
[Rosemary; Maltese: Klin]

A large shrub characterizing certain types of low maquis communities of valley sides (e.g. Wied Babu) and screes (e.g. Rdum Dikkiena).

*Salvia fruticosa* Miller E, Rest (MI)  
(= *S. triloba* L. fil.)  
[Three-lobed Sage; Maltese: Salvja]

On the verge of extinction probably due to constant collection. Less than a handful of shrubs still exist on rocky ground close to Buskett. Also cultivated as a culinary herb. Records of *S. officinalis* L. in the wild should probably be referred to this species.

*Stachys ocymastrum* (L.) Briquet R, Rest (MI)  
(= *S. hirta* L.)  
[Hairy Woundwort]

Rare in Malta. Less so in Gozo.

*Teucrium scordium* L. subsp. *scordoides* (Schreber)Arcangelii E, Rest (MI)  
[Water Germander]

Used to occur along several watercourses (Sommer & Caruana Gatto, 1915) but eventually seems to have become restricted to the watercourse at Bahrija. The small population existing here was recently severely damaged

by run off containing excessive herbicide as well as by continuous interference with its habitat, has not been seen for a few years and may be already extinct.

# Family: Solanaceae

*Lycium intricatum* Boissier  
[Southern Tree-tree; Maltese: [Shawes]]  
R, Rest (MED+MI)

This rare shrub has featured in all published Maltese floras (e.g., Sommer & Caruana Gatto, 1915; Borg, 1927; Haslam et al., 1977) as *L. europaeum* L. which is actually a different species.

# Family: Scrophulariaceae

*Verbascum creticum* (L.) Gavanilles  
(= *Gelsia cretica* L.)  
[Glandular Mullet; Maltese: Xatbet l-Andar kbir]  
RR, Rest (MED+MI)

Always rare, seems to be steadily decreasing.

*Linaria pseudolaxiflora* Lojacono  
(Maltese Toadflax; Maltese: Papocci ta' Malta)  
R, Rest (MED+MI)

A Pelago-Maltese endemic restricted to Malta, Lampedusa and Linosa. Very rare in Malta, less so in Gozo.

*Kickxia elatine* (L.) Dumortier  
[Sharp-leaved Flue-lin; Maltese: Xatbet l-Art Skars]  
RR, Rest (MI)

Seems to have become much rarer than literature references indicate. Maltese plants seem to belong to the subsp. *crinita* (Mabille) Greuter (= *Linaria sieberi* Reichenbach)

*Scrophularia auriculata* L.  
[Water Figwort; Maltese: Fiswet il-Kalb tal-Lima, Verga tal-Madonna]  
R, Rest (MI)

Now confined to the watercourse at Bahrja. Its population has been steadily decreasing as a result of the constant disturbance to its habitat.

# Family: Orobanchaceae

*Orobanche cernua* Loefling  
[Drooping Broomrape; Maltese: Budebbus tax-Xatt]  
RR, Rest (MI)

A rare species confined to low-lying coastal habitats.

*Orobanche clausonii* Pomet  
[Glandular Broomrape; Maltese: Budebbus ta' San Pawl]  
X(?), Rest (MED)

The first and only record is that of Sommer & Caruana Gatto (1915). A species confined to the extreme western Mediterranean. The Maltese plants were attributed to the form *parviflora* Beck.

*Orobanche densiflora* Salzmann forma *melitensis* Beck ●, R, Rest (MI)  
[Sand Broomrape; Maltese: Budebbus tar-Ramell]

The type is restricted to the extreme SW Mediterranean and South Portugal. The form found in Malta is presumably endemic and is restricted to sand dune habitats as at Mellieha Bay and Ramla tat-Torri. It is a parasite of *Lotus cytoides* L.

*Orobanche nana* (Reut.) Noë forma *melitensis* Beck ●  
[White Broomrape; Maltese: Budebbus Abjad]

A very common broomrape which normally parasitizes the Cape Sorrel (*Oxalis pes-caprae* L.). The white flowered form is endemic.

## Family: Plantaginaceae

*Plantago albicans* L. X(?), Rest (MED)  
[Downy Plantain; Maltese: Biżbula Bellusija]

Has been wiped out from its last known outpost as a result of modifications in the harbour area.

*Plantago bellardi* Allion! RR, Rest (MI)  
[Hairy Plantain; Maltese: Biżbula Sufija]

Seems to be confined to the western part of the Marfa Peninsula and the high ground overlooking Ġnejna Bay.

(\*) *Plantago bombycina* Decaisne I, Rest (MED)  
(= *P. crypsoides* Boissier)  
[Sea Buck's-horn Plantain; Maltese: Saġib i-Art ta' Kemmuna]

Belongs to the *P. coronopus* aggregate. This group still requires critical investigation. This entity is essentially North African. In the Maltese Islands, it is frequent at Comino.

## Family: Caprifoliaceae

*Sambucus ebulus* L. R, Rest (MI)  
[Dwarf Elder; Maltese: Sebuqa Salvagga, Nittienal]

Very rare in Malta, less so in Gozo. It seems to have become rarer mainly due to its eradication by farmers since it tends to invade the margins of fields.

## Family: Valerianaceae

*Centranthus ruber* (L.) DC. RR, Rest (MI)  
[Red Valerian; Maltese: Toppu tar-Reginal]

Occasionally cultivated and naturalized (e.g. University grounds at Msida and Old Railway Station at Attard). Possibly a true native as at Ġnien il-Kbir.

*Valerianella microcarpa* Loiseleur E, Rest (MI)  
[Small-fruited Cornsalad; Maltese: Valerjaneġla tar-Ramej]

Restricted to Ramla tat-Torri where it grows in the sand. Has not been seen for a few years and possibly already extinct. Often recorded as *V. puberula* (Bertoloni in Gussone) DC., a different species which is not found in the Maltese Islands.

*Valerianella truncata* (Reichenbach) Betsche RR, Rest (MI)  
(= *V. muricata* (Stevens) Baxter)  
[Oblique-fruited Cornsalad; Maltese: Valerjaneġla tar-Raba']

Restricted to irrigated ground. May be less rare than it seems due to its close resemblance to the common *Valerianella eriocarpa* Desvaux (Hairy-fruited Cornsalad; Maltese: Valerjaneġla Komuni)

#### Family: Campanulaceae

*Legousia hybrida* (L.) Delarbre var. *foliosa* Sommier & Caruana Gatto ●(?), X(?)  
[Venus's Looking-glass]

Used to grow in fields at Żebbiegħ and Żurriq and a few other places (Sommier & Caruana Gatto, 1915). Has not been seen for many decades. The Maltese plants differ from the type in details of leaf size, sepal length, branching and hairiness. Sommier & Caruana Gatto (op.cit.) suggest that Maltese plants should be distinguished as the var. *foliosa* if these peculiarities prove constant. Unfortunately the status of this possibly endemic variety cannot be assessed since the plant seems to have become extinct.

#### Family: Asteraceae (=Compositae)

*Anthemis urvilleana* (DC.) Sommier & Caruana Gatto ●  
(= *A. secundiramea* Bivona subsp. *urvilleana* (DC.) Fernandez)  
[Maltese Sea-chamomile; Maltese: Bebbuna tal-Baħar]

A low-growing endemic which is frequent in seaside habitats. Sometimes considered to be identical to *A. cossyrensis* Gussone of Pantelleria but according to Brullo (personal communication) they should be kept distinct.

*Atractylis cancellata* L. RR, Rest (MED+MI)  
[Cage Thistle; Maltese: Xewk tal-Gaġġa]

Has been steadily on the decrease and is now a very rare plant.

*Calendula suffruticosa* Vahl, subsp. *fulgida* (Rafinesque) Ohle var. *gussonii* (Lanza) Ohle I, Rest (MED)  
(= *C. sicula* Gussone; incl. *C. fulgida* Rafinesque var. *melitensis* Sommier & Caruana Gatto)  
[Sicilian Marigold; Maltese: Suffeġra ta' Malta]

An Hybleo-Maltese endemic (i.e. restricted to SE Sicily and the Maltese Islands). Not rare but exact status not determined due to ease of confusion



with the more frequent subsp. *fulgida* var. *fulgida*. Sommier & Cardana Gatto (1915) regarded the Maltese plants as different from those of Sicily.

*Garduncellus coeruleus* (L.) C. Presl R, Rest (MI)  
(= *Carthamus coeruleus* L.)  
(Blue Thistle; Maltese: Xewk [khal])

(\*) *Carlina involucrata* Poiret Rest (MED)  
(Clustered Carlina-Thistle; Maltese: Sajtun)

This very common thistle actually has a very restricted Mediterranean distribution. It is essentially a North African entity; also found on Lampedusa. Usually recorded as a variety of *C. corymbosa* L.

*Gatananche lutea* L. R, Rest (MI)  
(Yellow Gatananche; Maltese: Żigland Bellus)

*Centaurea melitensis* L. R, Rest (MI)  
(Maltese Star-thistle; Maltese: Ċentwarja Rqiqal)

In spite of its name this species is not restricted to our Islands but is quite widely distributed in the southern Mediterranean and has become naturalized in warm climates in other parts of the world. In Malta it has been steadily decreasing and now is a rare plant. Its attribution to Malta has resulted from its being first described from Maltese material by Paolo Boccone as "*Jacea melitensis capitulis conglobatis*" (Boccone, 1674).

*Chiliadenus bocconei* Brullo ●  
(Maltese Fleabane; Maltese: Tulliera Salvagga)

Has been usually recorded as *Jasonia glutinosa* (L.) DC. which is actually a complex of different species. These were studied by Brullo (1979) who demonstrated that Malta's plants were distinct. The specific name is dedicated to Paolo Boccone who was the first to recognize the uniqueness of the Maltese plants describing them as "*Conyza melitensis retusis foliis*" (Boccone, 1674). It is possibly the commonest of our endemic plants and the only one which has invaded disturbed ground. In fact, apart from growing on cliffs and garigues, it also grows on old walls and fortifications.

*Chamaemelum fuscatum* (Brotero) Tutin X(?)  
(= *Anthemis fuscata* Brotero; *Anthemis praecox* Link)  
(Dark Chamomile; Maltese: Kamumella Rari)

Not seen for many decades.

*Chamomilla aurea* (Loefling) Gay ex Coss. & Kralik X(?), Rest (MED)  
(= *Matricaria aurea* (Loefling) Schultz Bipontinus)  
(Maltese: Kamumella Nana)

Plants from the Maltese Islands, Lampedusa and Cyprus seem to belong to a form different from that occurring in the rest of the Mediterranean. Its last remaining haunt was the Gozo Citadel (Lanfranco, 1981) from where it has been eradicated.

*Chrysanthemum segetum* L. R, Rest (MI)  
(Corn Daisy; Maltese: Lelliux ta' Ghawdex)

Very rare and steadily diminishing on Malta but not uncommon in certain parts of Gozo where it tends to grow in fields.

*Chondrilla juncea* L.

E, Rest (MI)

[Maltese: T'fief ta' l-Ghadira]

Rapidly diminishing and on the verge of extinction.

*Crepis pusilla* (Sommer) Merxmüller

RR, Rest (MED+MI)

(= *Melitella pusilla* Sommer)

[Maltese Dwarf Hawksbeard; Maltese: Melitella]

This dwarf plant was first described by Sommer (1907) as a species of the new genus *Melitella*. This very distinctive plant was eventually transferred to the large genus *Crepis* of which it represents an aberrant species. Although unconfirmed records from Libya date back to 1912, the first authenticated extra-Maltese records date to 1967 (Greece). Since then it has turned up in several other Mediterranean stations in Majorca and in Portugal and also in Australia, undoubtedly as an adventive. Borg (1909) describes a variety *laciniata* which is probably just an ecological form. For more information see Lanfranco (1974) and Pignatti (1982).

*Helichrysum melitense* (Pignatti) Brullo, Lanfranco, Pavone & Ronsisvalle

●, RR, Rest (MI)

(= *H. rupestre* (Rafinesque) DC. var. *melitense* Pignatti) [Maltese Everlasting; Maltese: Sempreviva ta' Ghawdex]

Found on the cliffs along the western coast of Gozo and on the General's Rock (Magret il-General). Although recorded also from Malta, it has not been seen for many decades.

*Hyoseris frutescens* Brullo & Pavone

●

[Maltese Hyoseris; Maltese: Żigland ta' Ghawdex]

Although not a rare species, this only applies insofar as Gozo is concerned. It was thought to be endemic to Gozo until 1987 when a small population was discovered at Rdum il-Qawwi. Represents a primitive stage within the genus and is possibly a Tertiary relict. Only recently described (Brullo & Pavone, 1988).

*Onopordum argolicum* Boissier

R, Rest (MED+MI)

[Argolian Cotton-thistle; Maltese Xewk ta' Ghawdex]

Has become rare on Malta; less so on Gozo.

*Palaeocyanus crassifolius* (Bertoloni) Dostal

●, R, Rest (MI)

(= *Centaurea spathulata* Zerafa non Tenore; *Centaurea crassifolia* Bertoloni)

[Maltese Rock-centaury; Maltese: Widnet il-Bahar]

In 1971, this was officially designated as Malta's National Plant. It was first described by Zerapha (1827) as *Centaurea spathulata*. However the name had already been used by Tenore for a different plant in 1811 so that in 1829, Bertoloni renamed it *Centaurea crassifolia*. The Czech botanist Josef Dostal transferred the plant into a new genus, *Palaeocyanus* (Dostal, 1975). Occurs only on cliffs in the south and west of Malta and in southern Gozo.

*Pulicaria dysenterica* (L.) Gaertner  
[Common Fleabane; Maltese: Tulliera tal-Buskett]

R, Rest (MI)

Now confined to Buskett and Ghajn il-Kbira where, however, it is quite numerous.

*Pulicaria odora* (L.) Reichenbach  
[Mediterranean Fleabane; Maltese: Tulliera tad-Dejl]

X(?)

Although once not uncommon, it has not been seen for several decades.

*Scolymus grandiflorus* Desfontaines  
[Large-flowered Golden Thistle; Maltese: Xewk Isfar Kbir]

RR, Rest (MED+MI)

Has been steadily decreasing and is now a very rare plant.

*Senecio leucanthemifolius* Poiret  
[Cliff Groundsel; Maltese: Kubrita ta' l-Irdum]

R, Rest (MED+MI)

A very variable species with the characteristic of producing distinct localized races the systematic value of which is uncertain. Maltese populations still need to be studied.

*Senecio pygmaeus* DC.  
[Pygmy Groundsel; Maltese: Kubrita Nana]

RR, Rest (MED+MI)

Seems to be a Siculo-Maltese endemic. Occurs in exposed places close to the sea.

*Phagnalon graecum* Bolssler & Heldreich subsp. *ginzbergeri* Pignatti  
[Maltese: Lixka]

Rest (MED)

This subspecies is distributed mainly on the islands of the Aegean region with the Maltese Islands as its extreme westernmost outpost. Common especially on degraded garigues.

*Rhagadiolus stellatus* (L.) Willdenow  
[Star Hyoseris; Maltese: Żigland tar-Raġġil]

RR, Rest (MI)

Has decreased steadily and is now very rare.

Subclass: L I L I I D A E (Monocotyledons)

Family: A l i s m a t a c e a e

*Damasonium bourgaei* Cosson  
(= *D. alisma* Miller subsp. *bourgaei* (Cosson) Maire)  
[Mediterranean Starfruit; Maltese: Damasonjul]

V, Rest (MED+MI)

Confined to freshwater which accumulates in pools on rocky ground in the wet season. Often included in *D. alisma* but recent studies suggest that it is a distinct species (Vuille, 1987). Of very restricted Mediterranean distribution.

Families: Hydrocharitaceae; Zosteraceae;  
Posidoniaceae and Cymodoceaceae

These families are treated in Section B dealing with the marine flora.

Family: Juncaginaceae

*Triglochin bulbosum* L. subsp. *barrelieri* (Loiseleur) Rouy R, Rest (MI)  
[Bulbous Arrow-grass; Maltese: Triglakin tal-Melħ]

Restricted to saline marshlands at Ghadira and Salini/Qawra. An interesting species with two disjunct subspecies: one in the Mediterranean while the nominate subspecies is South African.

Family: Potamogetonaceae

*Potamogeton pectinatus* L. V, Rest (MI)  
[Fennel Pondweed]

Occurs only at Ghajn il-Kbira. Native status uncertain. This and other species of *Potamogeton* were recorded by Gulia (1873) but almost certainly in error.

Family: Ruppiaceae

(\*) *Ruppia drepanensis* Tineo E, Rest (MED+MI)  
[Lesser Tassel-pondweed; Maltese: Ruppja tal-Ghadira]

Occurs only at Ghadira where it is endangered by eutrophic phenomena. Possibly a subspecies of *R. cirrhosa* (Petagna) Grande (= *R. spiralis* L. ex Dumortier).

*Ruppia maritima* L. E, Rest (MI)  
(= *R. rostellata* Koch)  
[Beaked Tassel-pondweed; Maltese: Ruppja tas-Salini]

Only found in brackish water at Salini, Is-Simar (St. Paul's Bay) and Il-Magħluq (Marsaskala). The populations from Marsa and Marsaxlokk no longer exist.

Family: Zannichelliaceae

*Zannichellia palustris* L. subsp. *pedicellata* (Wahlenberg &  
Rosen) Hegl R, Rest (MI)  
[Horned Pondweed; Maltese: Marira tal-Ilma]

Normally confined to pools on rocky ground but occasionally also found in slow watercourses and brackish water. The Maltese populations require careful investigation.



Family: Liliaceae

*Aloe vera* (L.) Burmann fil. V, Rest (MED+MI)  
 (= *A. barbadensis* Miller)  
 [Yellow Aloe; Maltese: Żabbara, Żabbar]

Wild populations are on the decline. Still exists in small quantities in Gozo (e.g. Wied is-Sabbara). Commonly cultivated and considerable doubt persists as to whether it is truly native.

*Asphodelus fistulosus* L. RR, Rest (MI)  
 [Pink Asphodel; Maltese: Berwieq Żgħir]

Restricted to a few isolated localities. Some populations are threatened because they grow in residential areas.

*Bellevalia romana* (L.) Reichenbach R, Rest (MI)  
 (= *Hyacinthus romanus* L.)  
 [Roman Hyacinth; Maltese: Ġjafini Salvagg]

Restricted to clay soils, especially in fields.

*Muscari commutatum* Gussone RR, Rest (MI)  
 [Narrow-leaved Grape-hyacinth; Maltese: Muskar! Skur]

A recent discovery (Briffa, 1986).

*Muscari neglectum* Gussone R, Rest (MI)  
 [Southern Grape-hyacinth; Maltese: Muskari tal-Blat]

*Ornithogalum divergens* Boreau X(?)  
 (= *O. umbellatum* L. var. *divergens* (Boreau) G. Beck  
 [Lesser Star-of-Bethlehem; Maltese: Halib it-Tajr Żgħir]

Used to be frequent at Buskett but not seen for several decades.

*Tulipa sylvestris* L. E, Rest (MI)  
 [Wild Tulip; Maltese: Tulipan Salvagg]

Confined to a single fallow field at Wied Qirda. The plants show characters which are intermediate between subsp. *sylvestris* and subsp. *australis* (Link) Pampanini.

(\*) *Urginea pancration* (Steinhell) Philippe Rest (MED)  
 (= *U. maritima* (L.) Baker pro parte; *Drimis maritima* (L.) Stearn pro parte)  
 [Seaside Squill; Maltese: Ghansal, Ghansar]

This species was first described from Maltese material. It is confined to Malta, Sicily and several circum-Sicilian islands, the Pelagian Islands, Sardinia, Corsica and Mallorca. It is a diploid with  $2n=20$  as against typical *U. maritima*, in which it is usually included, which is hexaploid ( $2n=60$ ).

*Scilla sicula* Tineo ex Gussone R, Rest (MED+MI)  
 [Sicilian Squill; Maltese: Ghansal Ikhall]



This species is also known from Sicily and Calabria. Nevertheless it appears to have disappeared from these localities and may now therefore be confined to the Maltese Islands. Plants with blue flowers have been described as *Scilla clusii* and are now possibly extinct; however, these may not be distinct from *Scilla peruviana* L.

Family: A l l i a c e a e

*Allium amethystinum* Tausch R, Rest (MI)  
(= *A. sphaerocephalon* L. var. *descendens* auct. non L.)  
[Purple Garlic; Maltese: Tawm Vjojal]

Confined to some exposed rocky plateaux in NW Malta.

*Allium arvense* Gussone RR, Rest (MI)  
(= *A. sphaerocephalon* L. subsp. *arvense* (Gussone) Arcangelii)  
[White Round-headed Garlic; Maltese: Tawm ta' Ghawdex]

Found only in Gozo where it fringes the cliff tops in the NW and W. Not previously recorded.

*Allium liofaconii* Brullo, Lanfranco & Pavone ●  
[Maltese Dwarf Garlic; Maltese: Tawm Irqiq ta' Malta]

This recently described endemic (Brullo et al., 1982) used to be confused with the Sardo-Corsican endemic *A. parviflorum* Viviani, to which it bears a superficial resemblance. It is not uncommon on rocky ground especially not far from the coast. Often overlooked because of its small size.

(\*) *Allium melitense* (Sommer & Caruana Gatto) Ciferri & Giacomini ●(?)  
[Maltese Leek; Maltese: Kurrat ta' Malta]

This plant, of uncertain systematic status, is closely related to *A. ampeloprasum* L. (Wild Leek). Maltese populations of this group of species require critical examination. It is uncertain whether true *A. ampeloprasum* actually occurs in the Maltese Islands, the larger plants being possibly *A. commutatum* Gussone while smaller plants would be *A. melitense* (Brullo, personal communication). Very large leeks found on Filfla may be a new undescribed entity. Large leeks similar to those of Filfla were found by M. Briffa on General's Rock.

*Allium triquetrum* L. RR, Rest (MI)  
[Three-cornered Garlic]

Very rare in the wild, however it is naturalized in some gardens.

Family: R u s c a c e a e

*Ruscus hypophyllum* L. RR, Rest (MI)  
[Greater Butcher's-broom; Maltese: Belladonna, Ruskul]

This is a commonly cultivated species and it occasionally becomes naturalized. The population occurring at Ghajn il-Kbira, however, may represent a true native stand.

Family: **Amaryllidaceae**

(\*) *Narcissus elegans* (Haworth) Spach RR, Rest (MED+MI)  
[Elegant Narcissus; Maltese: Nardis Imwathar Skars]

Closely related to the common *Narcissus serotinus* L., and perhaps not specifically distinct. Found only once by H. Spiteri at San Pawl tat-Tarġa.

*Pancratium maritimum* L. V, Rest (MI)  
[Sea Daffodil; Maltese: Pankrazju, Nardis il-Bahar]

Persists only in some sand dune habitats. Sand dunes are both rare and fast disappearing as a result of beach development for recreational purposes. Bulbs are often collected for cultivation.

Family: **Dioscoreaceae**

*Tamus communis* L. R, Rest (MI)  
[Black Bryony; Maltese: Tamus]

Restricted to a few ravines. Less rare in Gozo.

Family: **Iridaceae**

*Crocus longiflorus* Rafinesque RR, Rest (MED+MI)  
[Autumn Crocus; Maltese: Żagħfran Salvagġ]

Restricted to rocky areas south of Buskett and Rdum tax-Xagħra (Gozo). A Central Mediterranean endemic ranging from Sicily to South Italy and Dalmatia (apart from the Maltese Islands).

*Gladiolus dubius* Gussone R, Rest (MED+MI)  
[Southern Gladiolus; Maltese: Mabb il-Qamh tal-Wied]

Easily confused with the common Corn Flag (Maltese: Mabb il-Qamh tar-Raba').  
*G. italicus* Miller (*G. segetum* Ker-Gawler).

*Gynandris sisyrinchium* (L.) Parlatore var RR, Rest, (MI)  
[Spanish Nut-Iris; Maltese: Fjurdulis Salvagġ]

The typical form of this species is very common and is one of the most valuable adornments of the Maltese spring countryside. An earlier flowering large form, often with three leaves, occurs in at least two localities. This may be the "*Iris aegyptiaca* Delil." recorded by Grech Delicata (1853). It may also have given rise to Borg's (1927) record of *Gynandris sicula* (Todaro) Todaro, a misunderstood taxon reputedly endemic to Sicily but now seemingly lost (see Goldblatt, 1980).

*Iris foetidissima* L. V, Rest (MI)  
[Gladdon; Maltese: Fjurdulis tal-Bosk]

Found only at Wied il-Luq (Buskett Valley) where it is endangered by constant interference with the habitat. If left alone this is a very vigorous plant and will no doubt re-establish itself.



(a) Malta's national plant, The Maltese Rock-centaury, *Palaeocyanus crassifolius*, is endemic to the Maltese Islands. (Photo: E. Lanfranco).



(b) The Sicilian Iris, *Iris sicula*, is endemic to Sicily and the Maltese Islands. (Photo: Joe Sultana).



*Iris pseudo-acorus* L. X  
[Yellow Corn-flag; Maltese: Fjurdulis tal-Iima, Fjurdulis Isfar]

Used to occur in the ditch around Mdina but long extinct.

*Iris pseudopumila* Tineo V, Rest (MED+MI)  
[Southern Dwarf Iris; Maltese: Bellus]

First discovered in 1970 (Wayfarer, 1976). Occurs in several colour forms (mainly purple based and yellow based) in a few localities in Malta and Gozo. A strict Central Mediterranean endemic found also in Sicily and Puglia in southern Italy.

(\*) *Iris sicula* Todaro V, Rest (MED+MI)  
[Sicilian Iris; Maltese: Fjurdulis Sqall]

This very rare species occurs in about three localities in Malta and Gozo. Its populations are especially vulnerable since they occur in areas which are close to new developments. One Malta population was nearly completely eradicated by a bird-trapper (M. Briffa, personal communication). Seems to be endemic to the Maltese Islands and Sicily where it also appears to be rare. A poorly understood species related to *Iris pallida* Lamarck from which it differs by the larger and darker flowers. There has been considerable confusion largely resulting from the name being similar to Todaro's own *Gynandris sicula* (= *Moraea sicula* Todaro) belonging to a genus which some botanists include in *Iris*.

*Romulea melitensis* Begunot ●, I  
[Maltese Sand-crocus; Maltese: Żagħfran tal-Blat Malti]

This endemism resembles other *Romulea* species quite closely as a result of which its frequency is difficult to assess. However it does not appear to be frequent.

#### Family: Juncaceae

*Juncus capitatus* Weigel X(?)  
[Dwarf Rush; Maltese: Simar Irqiq]

Not recorded for over a century. Used to exist at Ghajn Mula.

*Juncus effusus* L. X(?)  
[Soft Rush; Maltese: Simar Mufif]

A single specimen at the Argotti Botanic Gardens herbarium [ARG] seems to be correctly identified as this species. It was collected by Stefano Zerafa. According to Grech Delicata (1853) it used to occur at Marsa.

*Juncus maritimus* Lamarck V, Rest (MI)  
[Sea Rush; Maltese: Simar tal-Baħar]

Seems to persist only in the saline marshes at Il-Ballut (Marsaxlokk) and Il-Magħluq (Marsaskala)

Family: P o a c e a e

*Aeluropus lagopoides* (L.) Trinius ex Thwaites X(?), Rest (MED)  
[Cat's Foot Grass; Maltese: Sieq il-Qattus]

First discovered at Qalet Marku by Silverwood (1971); subsequently at Dwejra (Gozo) by P.A. Wolsley (Haslam et al., 1977). Partial to saline soils. The Qalet Marku population was destroyed by development. The Dwejra plants, which belong to a different form with very crowded leaves, have not been seen for several years.

*Alopecurus pratensis* L. X  
[Meadow Foxtail; Maltese: Denb il-Gurdien]

Used to exist at Marsa. Long extinct.

*Ammophila littoralis* (Beauvois) Rothmaler X(?)  
(= *A. arenaria* (L.) Link subsp. *arundinacea* H. Lindberg)  
[Marram Grass; Maltese: Qasba tar-Ramej]

Used to exist in several dunes such as at Mellieha Bay, Armier and Ramla tat-Torri but all populations have been eradicated within the past fifteen years. The last to succumb was the population at Ramla tat-Torri which disappeared in the early 1980s!

*Amelodesmos mauritanica* (Poiret) Durand & Schinz E, Rest (MI)  
[Maltese: Dis]

Now limited to just a handful of clumps growing at Wied Gerżuma.

*Anthoxanthum gracile* Bivona-Bernardi Rest (MED)  
[Slender Vernal Grass]

A rather uncommon grass found in shaded rocky situations. Restricted to the SE Mediterranean, westwards to Malta, Sardinia and Corsica.

*Anthoxanthum odoratum* L. X  
[Sweet Vernal Grass]

Used to exist at Marsa. Has been extinct for more than a century.

*Anthoxanthum ovatum* Lagasca X(?), Rest (MED)  
[Ovate Vernal Grass]

Not previously recorded. Two specimens occur at the herbarium of the Argotti Botanic Gardens (ARGJ). One, without data, is included in a herbarium compiled by M.A. Delia. The provenance of many plants in this compilation is questionable. Another specimen is included with the same folder as *A. odoratum*. It appears to have been collected by Grech Delicata from Marsa.

*Avellinia michellii* (Savi) Parlatores X(?)  
[Michell's Hair-grass]

Found only once, more than 70 years ago (Sommer & Caruana Gatto, 1915); it is however a small easily overlooked grass.



*Bromus commutatus* Schrader subsp. *neglectus* (Pariatore) P. M. Smith  
 (= *B. neglectus* (Pariatore) Nyman) X(?), Rest (MED)  
 [Mediterranean Meadow Brome; Maltese: Horta Muswaf]

Has not been seen for many years. A single specimen collected from Wied Ghomor by Grech Delicata is deposited at the herbarium of the Argotti Botanic Gardens (ARG).

*Bromus alopecuroides* Poiré R, Rest (MED+MI)  
 [Foxtail Brome; Maltese: Horta Dejjaq]

Occurs close to water courses as at Wied Mula and Wied Qannotta. An eastern Mediterranean species.

*Catabrosa aquatica* (L.) Beauvois E, Rest (MI)  
 [Water Whorl-grass; Maltese: Katabrosa]

A very rare grass of watercourses. Endangered by the constant interference with such habitats.

*Crypsis aculeata* (L.) Aiton E, Rest (MI)  
 [Prickle Grass; Maltese: Kripsis]

A small grass confined to two small saline marshes (Ghadira s-Saira and Qaliet) in areas undergoing continuous development. Both localities have been recently devastated by a storm.

*Cornucopiae cucullatum* L. X(?), Rest (MED)  
 [Hooded Grass; Maltese: Kornukopja]

A SE Mediterranean species. It is difficult to establish its native status in the Maltese Islands. Seems to have disappeared.

*Cutandia maritima* (L.) W. Barbey R, Rest (MI)  
 [Sand Fern-grass; Maltese: Kutandja]

Confined to sand dunes.

*Cynosurus cristatus* L. X  
 [Crested Dog's-tail; Maltese: Denb il-Keib]

Seems to have become extinct well over a hundred years ago. Two specimens exist at the Argotti Botanic Gardens herbarium, one from Wied Babu labelled in Grech Delicata's handwriting, who also records it (Grech Delicata, 1853); the other, without locality, bearing a label in Zerafa's handwriting who also recorded it (Zerafa, 1827).

*Desmazeria pignattii* Brullo & Pavone Rest (MED)  
 [Pignatti's Fern-grass]

This recently described species (Brullo & Pavone, 1985) is endemic to SE Sicily and the Maltese Islands. It had previously been confused with *D. sicula* (Jacquin) Dumortier under which name it features in the literature. Confined to seaside localities. Widespread but by no means common.

*Echinaria capitata* (L.) Desfontaines X(?)  
 [Hedgehog Grass; Maltese: Ekinarja]

Recorded from Gozo by Sommier & Caruana Gatto (1915) but seems to have disappeared.

*Elymus flaccidifolius* (Boissier & Heldreich) Melderis  
X(?), Rest (MED)  
[Marsh Couch]

Recorded from Salini and Mistra but seems to have disappeared from both localities. In the case of Salini, it seems to have succumbed as a result of works carried out on the site (M.Briffa, personal communication).

*Elymus pycnanthus* (Godron) Melderis  
(= *Agropyron littorale* (Host) Dumortier)  
E, Rest (MI)  
[Sea Couch]

This very rare grass is confined to a small coastal stretch close to Qalet Marku.

*Festuca caesia* J.E.Smith  
(= *F. longifolia* Thuill)  
X  
[Blue Fescue; Maltese: Żwien]

Collected from Corradino by Grech Delicata and recorded by him as *F. ovina*. Sommier & Caruana Gatto (1915) recorded it as *F. duriuscula*. Both names have given rise to considerable confusion. The Grech Delicata specimen was identified by T.A.Cope of the British Museum as *F.caesia*. The equation of this with *F. longifolia* is by no means certain.

*Gastridium scabrum* C. Presl  
R, Rest (MED+MI)  
[Harsh Nit-grass; Maltese: Mustaċċ il-Qattus Ahrax]

*Glyceria plicata* Fries  
E, Rest (MI)  
[Plicate Sweet-grass]

A very rare grass of watercourses. Endangered by constant habitat disturbance.

*Hordeum bulbosum* L.  
X(?)  
[Bulbous Barley; Maltese: Xghir tal-Basia]

Used to occur in the Mellieha Bay area. Not seen for several decades.

*Hordeum hystrix* Roth  
RR, Rest (MI)  
(= *H. gussoneanum* Parlatores; *H. geniculatum* Allioni)  
[Mediterranean Barley; Maltese: Bunixxief tal-Mediterran]

Easily confused with the very similar Sea Barley (Maltese: Bunixxief tal-Baħar) *H. marinum* Hudson, which is quite frequent.

*Phalaris truncata* Gussone ex Bertoloni  
R, Rest (MI)  
[Truncate Canary Grass; Maltese: Skalora tal-Ġnejna]

Restricted to clays as at Ġnejna and Imġiebaħ.

*Piptatherum caeruleum* (Desfontaines) Beauvois  
E, Rest (MED+MI)  
[Blue Millet-grass; Maltese: Barrum ta' l-Irdum]

Not previously recorded. Discovered at Ta' Ċenċ (Gozo) in 1973 by S. Brullo and G. Ronsisvalle.

*Puccinellia fasciculata* (Torrey) E.P. Bicknell E, Rest (MI)  
[Borrer's Salt-marsh Grass]

Rapidly declining in numbers. Thus Sommer & Caruana Gatto (1915) give it from Marsa, Wied Gerżuma, Imtaħleb, Ġirgenti and Ġnien il-Kbir. In the middle sixties it still occurred in small numbers at Marsa. Now confined to a small population at Salini.

*Schismus arabicus* Nees X, Rest (MED)

Found only once by Armitage (1889) at Santa Venera. The locality is now all built up and it is difficult to establish whether the local plants were really indigenous.

*Sphenopus divaricatus* Gouan V, Rest (MI)  
[Wedge-footed Grass]

Populations of this once frequent grass have been steadily declining. Confined to a few saline localities such as Qaliet (Paceville), il-Magħluq (Marsaskala) and Ta' Xbiex, all in populated areas.

*Triplachne nitens* (Gussone) Link R, Rest (MED+MI)  
[Sea Nit-grass; Maltese: Mustaċċ il-Qattus tal-Baħar]

Occurs in saline localities along the NW seaboard.

Family: **A r e c a c e a e** (= Palmae, Principes)

*Chamaerops humilis* L. X(?), Rest (MED)  
[Dwarf Fan-palm; Maltese: Ġummar]

Does not seem to exist any more in the wild state. Seems to owe its disappearance to collection for horticulture. Frequently cultivated in gardens. It is eminently suitable for afforestation programmes in maritime garigues.

Family: **A r a c e a e**

*Dracunculus vulgaris* Schott X(?)  
[Dragon Arum; Maltese: Ġarni Qoxret is-Serp]

According to Grech Delicata (1853), used to occur at Wied iż-Żurrieq but not found by others. This unusual plant is sometimes cultivated as a curiosity and may occasionally naturalize in gardens.

Family: **S p a r g a n i a c e a e**

*Sparganium erectum* = X  
(= *S. ramosum* Hudson)  
[Branched Bur-reed; Maltese: Simar ta' l-ilma]



Used to exist at Marsa and Girgenti. Long extinct.

**Family: Typhaceae**

*Typha domingensis* (Persoon)Steudel R, Rest (MI)  
(= *T. angustata* Bory & Chaubard; *T. australis* Schumacher)  
[Southern Reed-mace; Southern Bulrush; Maltese: Buda]

In the literature only *T. latifolia* L. and *T. angustifolia* L. are recorded. While it cannot be excluded that populations which have disappeared might have belonged to these species, yet all plants which have been critically examined belong to *T. domingensis*. Was once endangered but now it is on the increase and populations can now be encountered in many watercourses.

**Family: Cyperaceae**

*Carex extensa* Goodenough E, Rest (MI)  
[Long-bracted Sedge; Maltese: Soghda tal-Bahar]

This was first found by the Sicilian Pietro Calceara in 1848 (Parlatore, 1852) and not seen again until it was rediscovered by M.Briffa close to Ghadira (Mellieha). This population was subsequently destroyed as a result of the construction of the Mellieha By-pass; however some clumps were transferred to the Ghadira Nature Reserve where they still survive (although it has failed to propagate). More recently, another small population was discovered at Wied Musa (Cirkewwa) (M.Briffa, personal communication).

*Carex halleriana* Asso R, Rest (MI)  
[Southern Sedge; Maltese: Soghda tal-Makkjal]

Small populations exist at Wied Babu, Wied Żnuber and Wied Has-Sabtan. The Maltese plants differ in some details from the typical form (Sommier & Caruana Gatto, 1915).

*Carex hispida* Willdenow V, Rest (MED+MI)  
[Hispid Sedge; Maltese: Soghda Kbir]

This large handsome sedge is found at Imtahieb. Recently a small population was also encountered at Fawwara (M. Briffa, personal communication).

*Cyperus capitatus* Vandell: non Burmann R, Rest (MI)  
(= *C. mucronatus* (L.)Mabille; *C. kalili* (Forskaal)Murbeck; *C. aegyptiacus* Gloxin; *C. schoenoides* Grisebuth, *Galilea mucronata* (L.)Parlatore)  
[Sand Galingale; Maltese: Bordi tar-Ramell]

Confined to dune habitats and steadily decreasing as a result of habitat disturbance. The best population is that of Ramla l-Bamra (Gozo).

*Cyperus distachyus* Allioni X(?)  
[Rush Galingale; Maltese: Bordi Iswed]

Used to occur in several watercourses. The last population persisted at

Wied Mula (Għajn Rihana) until the middle seventies when it was destroyed as a result of habitat disturbance.

*Cyperus fuscus* L. E, Rest (MI)  
(Brown Galingale; Maltese: Bordi Żgħir)

Now confined to San Martin where it is represented by the form *virescens* (G.F.Hoffmann) Vahl.

*Eleocharis ovata* (Roth) Roemer & Schultes RR, Rest (MI)  
(Southern Spike-rush; Maltese: Simar tal-Wardija)

First recorded by Kramer *et al.*, (1972) from Wardija.

*Isolepis cernua* (Vahl) Roemer & Schultes X(?)  
(= *Scirpus cernuus* Vahl; *S. savii* Sebastiani & Mauri)  
(Slender Club-rush; Maltese: Simar Irqiq)

Used to be quite frequent along springs and watercourses (Sommer & Caruana Gatto, 1915) but populations have declined steadily. Last seen at Wied Mula (Għajn Rihana) in the middle seventies. Destroyed by habitat disturbance.

*Schoenus nigricans* L. RR, Rest (MI)  
(Black Bog-rush; Maltese: Simar Iswed)

Seems to be decreasing.

*Scirpus maritimus* L. RR, Rest (MI)  
(= *Bolboschoenus maritimus* (L.) Pallas)

Some good populations occur at Gnejna and Wied is-Seqer (Gozo) but generally on the decrease due to habitat disturbance.

#### Family: Orchidaceae

*Anacamptis urvilleana* Sommer & Caruana Gatto ●, R, Rest (MI)  
(Maltese Pyramidal Orchid; Maltese: Orkida Piramidali ta' Malta)

This very distinct species is related to *Anacamptis pyramidalis* (L.) L.C.M. Richard, the Common Pyramidal Orchid which also occurs in the Maltese Islands being in fact much more frequent than the endemic species. Botanists who have only seen herbarium material do not accord it the status of a distinct species; those, however, who have actually investigated living material in the field all agree as to its distinctiveness (e.g. Kramer *et al.*, 1972; Del Prete *et al.*, 1984). No hybridization is known to occur since there is hardly any overlap in their flowering periods.

*Baillia robertiana* (Loiseleur) Greuter E, Rest (MI)  
(= *B. longibracteata* (Bivona-Bernardi) Parlatores; *Himantoglossum longibracteatum* (Bivona-Bernardi) Schlechter)  
(Giant Orchid; Maltese: Orkida Kbir)

First discovered in Malta by R. Hölscher (Lanfranco, 1975). Occurs in only one locality in western Malta.



*Neotinea maculata* (Desfontaines) Stearn  
(= *N. intacta* (Link) Reichenbach)

X(?)

Recorded by Gulia (1873b) from Ta' Ġenċ (Gozo). Gulia's record is unsubstantiated, however, an orchid described to the author by H. Spiteri, an orchid enthusiast, which he saw in the sixties could only fit this species.

*Ophrys apifera*  
(Bee Orchid; Maltese: Nahla)

X(?)

The last plants were seen at Ġnejna in 1954 (Guido Lanfranco, personal communication). Judging from the number of specimens in the herbarium of the Argotti Botanic Gardens (ARG), used to be quite frequent at Fiddien. The Ġnejna population was destroyed by habitat disturbance which brought about a change in the composition of the vegetation.

*Ophrys bertolonii* Moretti  
(Bertoloni's Bee Orchid; Maltese: Dubbiana)

E, Rest (MED+MI)

Seems to have disappeared from all the stations from which it was formerly recorded but a single specimen was discovered at Wied Dalam in 1985. It is possible that the Wied Dalam plant is an accidental import with soil from Sicily (see entry for *Micromeria graeca*, family: Lamiaceae).

*Ophrys lutea* (Gouan) Cavanilles  
(Yellow Orchid; Maltese: Żunżana)

RR (MED+MI)

Occurs sporadically in western Malta and Gozo. Two subspecies occur in the Maltese islands: subsp. *lutea*, which is extremely rare and subsp. *murbeckii* (Fleishmann) Soo, which is the entity usually met with.

*Ophrys tenthredinifera* Willdenow  
(Spider Orchid; Maltese: Nahla Kbira)

E, Rest (MED+MI)

Possibly the rarest of our non-extinct(?) species. Was found by Grech Delicata at Wied Babu (a herbarium specimen exists at the Argotti Botanic Gardens [ARG]). Not found again until the early eighties when a specimen was seen at Wardija (H. Spiteri, personal communication). The form seen differs in some details from the normal continental form of this species.

*Ophrys oxypetala* Todaro  
(Late Spider Orchid; Maltese: Brimba)

X(?), Rest (MED)

Very closely related to *O. holosericea* (Burmach) Greuter (= *O. fuciflora* (Crantz) Moench; *O. arachnites* (Scopoli) Lamarck) of which it is often regarded as a subspecies. The last living plants were seen in 1966 at Wied Filip, a branch of Wied il-Għasel (Guido Lanfranco, personal communication) which is now the site of a quarry! Maltese records of *O. holosericea* may refer to this species. Endemic to Sicily, Sardinia and Malta.

*Ophrys* sp. nov.  
(Maltese Spider Orchid; Maltese: Brimba Sewda)

●, Rest (MI)

Recorded in Maltese floras as "*O. sphegodes*" or its synonym "*O. aranifera*". While certainly closely related to *O. sphegodes* Miller and possibly subspecific to it, the Maltese plants do not agree either with the type or

any of its numerous subspecies and variants. Perhaps it comes closest to plants described as *O. sphegodes* subsp. *sicula* Nelson, in details of the individual florets but differs considerably from it in habit. The Maltese plant is extremely variable in its own right which has led several authors to record various species and subspecies belonging to the *O. lunulata* Parlatores. (See also Baumann, 1977).

*Orchis italica* Poiret E, Rest (MED+MI)  
[Naked-man Orchid; Maltese: Majja u Mejta tal-Werqa Fdewxa]

This is one of our rarest plants. Only a handful of individuals still exist, most of which are in one locality.

*Orchis morio* L. X(?)  
[Green-winged Orchid; Maltese: Orkida ta' l-Elmu]

Apparently extinct for over a century. A specimen collected by Gavino Gulia from Ta' l-Gholja exists at the Argotti Botanic Gardens Herbarium [ARG].

*Serapias lingua* L. E(?)  
[Tongue Orchid; Maltese: Orkida ta' l-lisien]

Not seen for over 70 years.

*Serapias vomeracea* (Burmach fil.) Briquet E, Rest (MI)  
[Long-lipped Tongue-orchid; Maltese: Orkida ta' l-lisien Kbir]

Only a handful of specimens of this very rare orchid still exist.

*Spiranthes spiralis* (L.) Chevallier R, Rest (MI)  
[Autumn Lady's Tresses; Maltese: Majja u Mejta tal-Marifa; Orkida tal-Marifa]

Small populations exist in a few scattered localities. Perhaps less rare than it appears since it is rather inconspicuous.

## B. THE MARINE FLORA

While we have a reasonably good, albeit incomplete, floristic record for the Maltese seas, it is still very difficult to actually identify which seaweeds are endangered, rare, threatened etc. This is mainly due to two reasons: (i) access to the circalittoral and lower infralittoral has been limited, there is no diver/botanist active in Malta and it is only currently that an embryonic project is attempting to combine the expertise of diver and botanist; (ii) even in the few cases where we can confidently claim that some particular species is rare in Maltese seas, it is still difficult to insert this in its proper Mediterranean perspective. Often enough our knowledge of the distribution of certain Mediterranean seaweeds more accurately reflects the distribution of Mediterranean marine botanists; it is significant that a number of rare seaweeds are only known from the vicinity of marine biological stations!

In this list some species which are actually frequent are included. This is done to highlight those plants which exist in large populations of high productivity and on which so many marine ecosystems depend. Ultimately, the

Mediterranean fisheries depend in good part on the continued healthy existence of these seaweeds. While such seaweed communities are still large and common, they are exceedingly sensitive to pollution and habitat modification and in fact they are fast being eroded away, creating in many parts of the Mediterranean large expanses of dead seaweeds (thanatocoenoses). It is vital that these seaweed communities are protected and, where possible, reestablished and extended to ensure the continued health of the Mediterranean. Remedial action by the Mediterranean countries should be taken now and not when the situation becomes critical.

#### a. SEA-GRASSES

Sea grasses are monocotyledonous flowering plants belonging to a small group of families. Although very few species exist, they are nevertheless exceedingly productive and of vital importance in the maintenance of many marine ecosystems. Many fish and cephalopods use the sea-grass meadows as breeding grounds.

*Halophila stipulacea* (Forskaal) Ascherson (Family: Hydrocharitaceae)  
R, Rest (MED+MI)

This subtropical species native to the Indian Ocean and the Red Sea has entered the Mediterranean following the opening of the Suez Canal (1869). It became established in the eastern Mediterranean and in 1970 was first noticed in the Maltese Islands (Lanfranco, 1970; Den Hartog, 1972). It seems to be spreading in sheltered inlets such as Marsaxlokk, Birzebbuga, Balluta Bay and St. George's Bay (St. Julians). Maltese plants provided the first record of the male flowers in this species.

*Zostera marina* L. (Family: Zosteraceae) X(?), Rest (MED)  
[Eel-grass]

Only recorded by Gulia (1873). Record not substantiated and confusion with *Cymodocea nodosa* (Ucria) Ascherson, cannot be ruled out. At any rate this species is now very rare in the Mediterranean, possibly decimated by the same or a similar disease as that which struck this species in the Atlantic.

*Zostera noltii* Hornemann (Family: Zosteraceae) X(?), Rest (MED)  
(= *Z. nana* Roth)  
[Slender Eel-grass]

Recorded only by Gulia (1873) and possibly in error. This is a species normally restricted to estuaries and lagoons.

*Posidonia oceanica* Delile (Family: Posidoniaceae)  
[Neptune Grass; Maltese: Aika, Posidonja]

The Neptune Grass forms extensive submarine meadows forming a sort of fringe skirting the Maltese coast. Its dead leaves are washed ashore forming huge embankments ("banquettes"). In spite of its high productivity the Neptune Grass is extremely sensitive to habitat modification and, in several places in the Mediterranean and even around Malta, it has been killed as a result of various forms of pollution. The Neptune Grass is endemic to the Mediterranean and it is also the most important seaweed, supporting a large variety of biota.

*Cymodocea nodosa* (Ucria) Ascherson (Family: Cymodoceaceae)  
[Lesser Neptune Grass; Maltese: Alka Rqiga, Ċimodoċja]

This species tends to grow in bays and harbours as well as in hollows within the *Posidonia* meadows. It sometimes occupies areas where the Neptune Grass dies through pollution. *Cymodocea* tolerates changes in salinity better than Neptune Grass but is nevertheless vulnerable to many forms of pollution. In its preferred habitats it is an important seaweed supporting a rich ecosystem.

#### b. ALGAE

Division: CHLOROPHYTA (Green Algae)

Class: BRYOPSIDOPHYCEAE (Siphonaceous Algae)

*Polyphysa parvula* (Solms-Laubach) Schnetter & Bula R, Rest (MED+MI)  
(= *Acetabularia parvula* Solms-Laubach, *A. Moebii* Solms-Laubach, *A. wettsteinii* Schussnig)  
[Lesser Mermaid's Drinking-glass; Maltese: Aċetabularja Żgħira]

First found in Maltese waters in 1975 (Lanfranco, 1975b; 1983) when it was met with at St. Paul's Islands. It was also recorded by Cinelli (1976). This species seems to have a very limited Mediterranean distribution occurring in Israel, Egypt, SE Sicily, the vicinity of Naples, the Balearics and Algeria (Cinelli, 1979). It is otherwise widespread in tropical seas. It is possible that this species entered the Mediterranean via the Suez Canal.

*Siphonocladus psyttaliensis* Schmitz

RR, Rest (MED+MI)

Only recorded by Moebius (1892) who distinguishes two forms. Never found again. A species which seems to be otherwise restricted to the Adriatic and the vicinity of Naples.

*Gaultheria prolifera* (Forskaal) Lamouroux

Forms extensive meadows in sheltered areas on soft bottoms; often forms mixed associations with *Cymodocea nodosa* (Ucria) Ascherson. Although cannot be considered rare, these populations are rapidly declining especially in the Marsaxlokk harbour where they were best developed. Like sea-grass meadows, populations of *Gaultheria* are important breeding grounds for many marine animals.

Division: PHAEOPHYTA (Brown Algae)

Class: PHAEOPHYCEAE

*Cystoseira* species  
[Sea-Firs]

Many species of *Cystoseira* exist in the seas around Malta. Different species characterize different depths and different habitats. While many species are common, forming extensive populations, these are extremely sensitive to pollution and to changes in salinity and illumination. These large seaweeds support an important ecosystem and their protection is essential. Most species are endemic to the Mediterranean.



Not previously recorded. First found at Marsaxlokk in 1978 and not yet found elsewhere.

*Hydroclathrus clathratus* (Bory ex C. Agardh)Howe

R

First found at Wied iż-Żurrieq in 1973 by H. Fudge (Lanfranco, 1974). Not yet found elsewhere.

*Sargassum* species

[Sargasso-weed; Maltese: Sargassu]

These are our largest Brown Seaweeds. At least three species are found. Although not rare, their numbers are threatened by pollutants.

Division: RHODOPHYTA (Red Algae)

Class: FLORIDEOPHYCEAE (Higher Red Algae)

*Acanthophora dillei* Lamouroux

Rest (MED)

(= *A. najaformis* (Dille) Papenfuss)

Not previously recorded. First encountered by Dr. J.H. Price of the British Museum (Natural History) (personal communication). Has become quite frequent in certain areas. An odd free floating form was encountered at Marsaxlokk. Immigrated into the Mediterranean following the opening of the Suez Canal.

*Chondria boryana* (De Notaris) De Toni

R, Rest (MED)

Recorded by Sommier & Caruana Gatto (1915). Has a restricted Mediterranean distribution.

*Spyridia hypnoides* (Bory) Papenfuss

R, Rest (MED+MI)

(= *S. aculeata* (Schimper) Kützting)

Not previously recorded. First found by the author in 1973. Seems to have a very restricted Mediterranean distribution, being apparently known only from Algeria and Sicily.

## C. THE FUNGI

This section has been divided into two parts for the sake of convenience: the MACROFUNGI and the MICROFUNGI. These terms have no meaning in taxonomy but are useful to distinguish those fungi with relatively large, fleshy sporocarps (i.e. "mushrooms") from those with minute reproductive structures.

Relatively little is known about the mycoflora of the Maltese Islands. Almost all our knowledge is due to the two compilations of Sommier & Caruana Gatto (1915) and Briffa & Lanfranco (1986). The many microfungi which were described as new species by Saccardo in various works and listed by Sommier & Caruana Gatto (op.cit.) have never been subjected to



critical study and they will thus feature here merely as a classified list. No indication of frequency can be given for these. Their names are left exactly as published except for one change of spelling. In the case of the macrofungi, I have selected a few species which seem to have a restricted distribution and habitat. It should be appreciated that with few exceptions, all macrofungi have been rarely recorded but many of these are liable to crop up in man-made habitats such as gardens, fields, roadsides, manure heaps and others.

#### a. THE MACROFUNGI

Division: EUMYCOTA (Higher Fungi)

Sub-Division: ASCOMYCOTINA (Bag Fungi)

Class: PYRENOMYCETES

*Daldinia concentrica* (Bolton ex Fries) Cesati & De Notaris  
[Cramp Balls] R, Rest (MI)

On dead branches from a few localities.

Class: DISCOMYCETES

*Helvella crispa* (Scopoli) Fries RR, Rest (MI)  
[White Morsel Fungus, Common Helvel; Maltese: Helvelia]

Only known from Imġiebaħ and Ballut tal-Wardiġa where it grows associated with the Holm Oak (Briġfa & Lanfranco, 1986)

*Sarcosphaera eximia* (Durand & Leveillé) Maire R, Rest (MI)

Only known from Buskett where it is associated with the conifers.

Sub-Division: BASIDIOMYCOTINA (Club Fungi)

Class: HYMENOMYCETES ("true" mushrooms)

*Agrocybe aegerita* (Briganti) Singer R, Rest (MI)

Parasitic on trees.

*Amanita ovoidea* Fries ex Bulliard RR, Rest (MI)  
[Ovoid Grisette]

Under conifers.

*Amanita verna* (Bulliard ex Fries) Persoon ex Vittadini RR, Rest (MI)  
[Southern Destroying Angel]

Seems to be very rare; very poisonous.

*Boletus luridus* Schaeffer ex Fries R, Rest (MI)  
[Lurid Boletus]

Mainly associated with *Cistus monspeliensis* at Ta' Wied Rini (Briġfa & Lanfranco, 1986).

*Boletus pulverulentus* Opatowski

RR, Rest (MI)

Only known from Buskett (Briffa & Lanfranco, 1986).

*Hygrocybe ovina* (Bulliard ex Fries) Kühner  
(= *Hygrophorus ovinus* Bulliard ex Fries)

RR, Rest (MI)

Only known from Ballut tal-Wardiġa (Briffa & Lanfranco, 1986).

*Lactarius sanguifluus* Paulet  
[Blood Milk-cap; Maltese: Faqqiegh tad-Demmi]

R, Rest (MI)

Only found at Ta' Wied Rini associated with *Cistus monspeliensis* (Briffa & Lanfranco, 1986).

*Montagnea candollei* Fries

E, Rest (MI)

This unusual mushroom, reminiscent of a Gasteromycete, is only known from the sand dunes at Ramla l-Hamra (Gozo) where it was discovered in May 1988. Not previously recorded.

*Phellinus robustus* (Karsten) Bourd. & Galz. forma *punicae* Saccardo  
and forma *amygdali* Saccardo

●(?), I

Described by Saccardo from Malta (Sommier & Caruana Gatto, 1915) as growing on Pomegranate and Almond respectively. Possibly endemic.

*Pleurotus nebrodensis* (Inzenga) Saccardo forma *minor* Saccardo

●, (?), R

This form was first described by Saccardo from Malta and may be endemic. The typical form is restricted to Sicily.

*Polyporus brumalis* Persoon ex Fries

R, Rest (MI)

Associated with the populations of *Cistus monspeliensis* at Ta' Wied Rini (Briffa & Lanfranco, 1986).

*Russula lepida* Fries  
[Pretty Russula]

R, Rest (MI)

Associated with *Cistus monspeliensis* at Ta' Wied Rini (Briffa & Lanfranco, 1986).

*Tricholomopsis platyphylla* (Persoon ex Fries) Singer

RR, Rest (MI)

Associated with conifers.

Class: GASTEROMYCETES

*Colus hirudinosus* Cav. & Sacc. forma *minor* Caruana Gatto

●, RR, Rest (MI)

This curious fungus is one of the few which seem to grow in garigues. Caruana Gatto records this form as new to science (Sommier & Caruana Gatto, 1915) but supplies no description so that the form name is still invalid.

This species was found on sandy soil at Salini (Sommer & Caruana Gatto, 1915) but has not been found since. In 1988 a *Tulostoma* which is still unidentified was found by Raymond Galea on the Islet of Filfla.

## b. THE MICROFUNGI

Only those taxa which have been first described from Maltese material are included here. Almost all owe their description to P.A. Saccardo in which case the authority is abbreviated to S. While these taxa can be regarded as endemic, it is unlikely that all of them are, especially considering that several of them have been found in close association with exotic plants in gardens.

Division: EUMYCOTA (Higher Fungi)

Sub-Division: ASCOMYCOTINA (Bag Fungi)

Class: LOCULASCOMYCETES

<i>Didymosphaeria borgii</i> Caruana Gatto	●(?)
<i>Didymosphaeria borgii</i> var. <i>meliae</i> S.	●(?)
<i>Didymosphaeria eucalyptina</i> S.	●(?)
<i>Didymosphaeria insularis</i> S.	●(?)
<i>Didymosphaeria spillogena</i> S.	●(?)
<i>Gloniella caruaniana</i> S.	●(?)
<i>Leptosphaeria insulana</i> S.	●(?)
<i>Leptosphaeria pachytheca</i> S.	●(?)
<i>Metasphaeria asparagina</i> S.	●(?)
<i>Metasphaeria asparagina</i> var. <i>smilacina</i> S.	●(?)
<i>Metasphaeria bocconeana</i> S.	●(?)
<i>Metasphaeria bonamiciana</i> S.	●(?)
<i>Metasphaeria melitensis</i> S.	●(?)
<i>Metasphaeria piricola</i> S.	●(?)
<i>Metasphaeria piricola</i> var. <i>jasminii</i> S.	●(?)
<i>Metasphaeria piricola</i> var. <i>periplocae</i> S.	●(?)
<i>Sphaerella implexae</i> Pass. var. <i>implexicola</i> S.	●(?)
<i>Venturia borgiana</i> S.	●(?)

Class: PYRENOMYCETES

*Physalospora borgiana* S. ●(?)

*Physalospora euganea* S. var. *viridarii* S. ●(?)

Class: DISCOMYCETES

*Tryblidiella assiminae* Caruana Gatto & S. ●(?)

*Tryblidiella olivatorum* S. ●(?)

Sub-Division: BASIDIOMYCOTINA (Club Fungi)

Class: TELIOMYCETES

*Aecidium bellidis-sylvestris* S. ●(?)

*Gaeoma bullosum* S. ●(?)

*Coleosporium carpesii* S. var. *asterisci-aquatici* S. ●(?)

*Coleosporium saccardianum* Caruana Gatto ●(?)

*Entyloma aristolochiae* S. ●(?)

*Entyloma debonianum* S. ●(?)

*Entyloma erodianum* S. ●(?)

*Puccinia mariana* S. ●(?)

*Puccinia rubigo-vera* (DC.) Winter forma *bromicola* S. ●(?)

*Puccinia rubigo-vera* forma *koeleriana* S. ●(?)

*Puccinia rubigo-vera* forma *lollicola* S. ●(?)

*Puccinia sommieriana* S. ●(?)

*Uromyces fabae* (Persoon) De Bary forma *ervi-ervilliae* S. ●(?)

*Uromyces fabae* forma *viciae-sativae* S. ●(?)

Sub-Division: DEUTEROMYCOTINA (Imperfect Fungi)

Class: COELOMYCETES

*Apospharaeria punicina* S. ●(?)

*Ascochyta diplodinoides* S. ●(?)

*Colletotrichum extorres* S. ●(?)

*Cylindrosporium mellitense* S. ●(?)

*Cylindrosporium torquens* S. ●(?)





(a) Bruennich's Argiope, *Argiope bruennichi*, is a spider associated with watercourses and has been found only at Wied il-Luq. (Photo: E. Lanfranco).



(b) This *Armadillidium aelleni* is a cave-dwelling woodlouse recently described from the Maltese Islands (Photo: P. J. Schembri).



<i>Cylindrosporium typhae</i> S.	●(?)
<i>Diplodia kaki</i> S.	●(?)
<i>Dothiorella allantina</i> S.	●(?)
<i>Gloeosporium borgianum</i> S.	●(?)
<i>Gloeosporium coccui</i> S.	●(?)
<i>Gloeosporium coccui</i> var. <i>ramicola</i> S.	●(?)
<i>Gloeosporium duthieanum</i> S.	●(?)
<i>Gloeosporium phormii</i> S.	●(?)
<i>Gloeosporium rhodobolus</i> S.	●(?)
<i>Hendersonia hyacinthiana</i> S.	●(?)
<i>Hendersonia melitensis</i> S.	●(?)
<i>Lasiodiplodia ricini</i> S.	●(?)
<i>Macrophoma alaterni</i> S.	●(?)
<i>Macrophoma aromatica</i> S.	●(?)
<i>Macrophoma aucubana</i> S.	●(?)
<i>Macrophoma glandaria</i> S.	●(?)
<i>Macrophoma insulana</i> S.	●(?)
<i>Macrophoma juglandaria</i> S.	●(?)
<i>Macrophoma monsterae</i> S.	●(?)
<i>Macrophoma phormiana</i> S.	●(?)
<i>Macrophoma salicina</i> S.	●(?)
<i>Macrophoma scandens</i> S.	●(?)
<i>Macrophoma viridarif</i> S.	●(?)
<i>Macrophoma yuccocarpa</i> S.	●(?)
<i>Macrophoma zeraphiana</i> S.	●(?)
<i>Microdiplodia agni-casti</i> S.	●(?)
<i>Microdiplodia bambusina</i> S.	●(?)
<i>Microdiplodia callitrina</i> S.	●(?)
<i>Microdiplodia foedans</i> S.	●(?)

<i>Microdiplodia iliceti</i> S.	●(?)
<i>Microdiplodia nigrificans</i> S.	●(?)
<i>Microdiplodia oleaginea</i> S.	●(?)
<i>Microxophium footii</i> Harw. var. <i>ciliolatum</i> S.	●(?)
<i>Pestalotia linearis</i> S.	●(?)
<i>Phoma anonicola</i> S.	●(?)
<i>Phoma cavalliniana</i> S.	●(?)
<i>Phoma ceratoniae</i> S.	●(?)
<i>Phoma epimelaena</i> S.	●(?)
<i>Phoma tenella</i> S.	●(?)
<i>Phoma urvilleana</i> S.	●(?)
<i>Phomopsis abutilonis</i> S.	●(?)
<i>Phomopsis coccolobae</i> S.	●(?)
<i>Phomopsis corynocarpi</i> S.	●(?)
<i>Phomopsis dalbergiae</i> S.	●(?)
<i>Phomopsis dianthiicola</i> S.	●(?)
<i>Phomopsis dianthina</i> S.	●(?)
<i>Phomopsis elaeagni</i> S.	●(?)
<i>Phomopsis extorris</i> S.	●(?)
<i>Phomopsis ficina</i> S.	●(?)
<i>Phoma gallicola</i> Trott. var. <i>melitensis</i> S.	●(?)
<i>Phomopsis gasteriae</i> S.	●(?)
<i>Phomopsis mediterranea</i> S.	●(?)
<i>Phomopsis phormicola</i> S.	●(?)
<i>Phomopsis pircuniae</i> S.	●(?)
<i>Phyllosticta araucariae</i> S.	●(?)
<i>Phyllosticta armitageana</i> S.	●(?)
<i>Phyllosticta brassicina</i> S.	●(?)
<i>Phyllosticta citricola</i> S.	●(?)

<i>Phyllosticta ruscigena</i> S.	●(?)
<i>Phyllosticta striolata</i> S.	●(?)
<i>Plendumus borgianus</i> S.	●(?)
<i>Rabenhorstia pachyderma</i> S.	●(?)
<i>Septoria ambigua</i> S.	●(?)
<i>Septoria antirrhini</i> Desm. var. <i>minor</i> S.	●(?)
<i>Septoria bromi</i> S. var. <i>brevispora</i> S.	●(?)
<i>Septoria caruaniana</i> S.	●(?)
<i>Septoria forskahleana</i> S.	●(?)
<i>Septoria henslowiana</i> S.	●(?)
<i>Septoria nymaniana</i> S.	●(?)
<i>Septoria thelygoni</i> S.	●(?)

**Class: HYPHOMYCETES**

<i>Aspergillus melitensis</i> S. & Peyr.	●(?)
<i>Cercospora ceratoniae</i> S.	●(?)
<i>Cercospora gullana</i> S.	●(?)
<i>Cercospora insulana</i> S.	●(?)
<i>Cercospora spinacicola</i> S.	●(?)
<i>Cladosporium grech-delicatae</i> S.	●(?)
<i>Cladosporium minusculum</i> S.	●(?)
<i>Cladosporium venturoides</i> S.	●(?)
<i>Cladosporium venturoides</i> var. <i>citricola</i> S.	●(?)
<i>Dicoccum apiosporum</i> S.	●(?)
<i>Exosporium rosicula</i> S.	●(?)
<i>Fusicladium caruaniatum</i> S.	●(?)
<i>Macrosporium cleghornianum</i> S.	●(?)
<i>Macrosporium eugonatum</i> S.	●(?)
<i>Macrosporium schini</i> S.	●(?)
<i>Ramularia brevipes</i> S.	●(?)

<i>Ramularia caruanaiana</i> S.	●(?)
<i>Stigmella perexigua</i> S.	●(?)
<i>Titaea submutica</i> S.	●(?)
<i>Torula peyronellii</i> S.	●(?)

## D. THE BRYOPHYTES

About 130 species of bryophytes are known to exist in the Maltese Islands. Of these, a little over a hundred are mosses. Although our picture of the Maltese bryoflora is far from complete, enough information exists to point out the relative frequency of many of the species. My own field experience indicates that we have a nucleus of common species which occur in diverse localities supplemented by numerous species which appear to have a very restricted distribution. In this compilation I have included those species which seem to be rarest; many of these have not been found since their original discovery.

Records prior to 1915 have been reviewed by Sommer & Caruana Gatto (1915). More recent compilations are those of Gradstein (1972) and Dia *et al.* (1985; 1987). Dia *et al.* (1987) include new records supplied by the late E.C. Wallace, who botanized in Gozo in 1985 and by myself. My own material has been largely determined by Montserrat Brugués of the Autonomous University of Barcelona to whom I am indebted. The family sequence used here is that of Dia *et al.* (1987).

Bryophytes have no circumscribed name in Maltese being usually referred to as *HAŻIŻ*, *HAŻŻ* or *HASS*, which names are used indiscriminately also for lichens, Cyanobacteria (Blue-green Algae) and several algae. When an accurate reference in Maltese is required I suggest using *MUSKI* for the mosses, *HEPATIČI* for the liverworts and *ANTOČEROTI* for the hornworts (which group does not feature in this compilation, since none of our species qualify for inclusion).

Division: BRYOPHYTA

Class: HEPATICOPSIDA (Liverworts)

*Petalophyllum ralfsii* (Wilson) Nees & Gottsche Rest (MED)

This beautiful liverwort is not rare in the Maltese islands. It has however, a somewhat limited distribution in the Mediterranean.

*Riccia melitensis* Massalongo ●, I, Rest (MI)

Described in 1913 (Massalongo, 1913) on specimens found by S. Sommer at Xlendi (Gozo). Has not been rediscovered with certainty. However, *Riccia* is a notoriously difficult genus.



*Riccia bicarinata* Lindberg

I, Rest (MED)

Maltese material was originally described by Massalongo (1913) as *R. henriquesii* Levier var. *mediterranea* Mass. from material collected by A. Caruana Gatto from Floriana in 1912.

Class: BRYOPSIDA (Mosses)

Family: F i s s i d e n t a c e a e

*Fissidens taxifolius* Hedwig  
[Yew-leaved Fork-moss]

R, Rest (MI)

First found in 1984 at Girgenti.

Family: P o t t i a c e a e

*Acaulon muticum* (Hedwig) C. Müller

RR, Rest (MI)

Not found since the original collection by Sickenberger in 1876 (Baur, 1891).

*Acaulon triquetrum* (Spruce) C. Müller

RR, Rest (MI)

Not found since its original collection by Sickenberger in 1876 (Baur, 1891).

*Aloina rigida* (Hedwig) Limpricht

R, Rest (MI)

First found in 1977 at Ġebel Ġantar.

*Barbula ehrenbergii* (Lorentz) Fleischer  
[Ehrenberg's Beard-moss]

R, Rest (MI)

*Crossidium crassinerve* (De Notaris) Juratzka

RR, Rest (MI)

Not recorded since 1876 when it was found by Sickenberger (Baur, 1891). Also recorded by Nyman (1844).

*Didymodon insulanus* (De Notaris) M.O. Hill  
(= *Barbula cylindrica* (Taylor) Schimper; *B. vinealis* (Bridel)  
Zander var. *flaccida* (Bruch & Schimper) Zander)

R, Rest (MI)

Found by E.C. Wallace in Gozo in 1985.

*Didymodon rigidulus* Hedwig

R, Rest (MI)

*Gyroweisia reflexa* (Bridel) Schimper

R, Rest (MI)

*Gyroweisia tenuis* (Hedwig) Schimper

R, Rest (MI)

Found by E.C. Wallace in Gozo in 1985.

*Phascum curvicolle* Hedwig

RR, Rest (MI)

Not found since the original collection by Sickenberger in 1876 (Baur, 1891).

*Phascum cuspidatum* Hedwig

RR, Rest (MI)

Not recorded since 1876 when it was found by Sickenberger (Baur, 1891).

*Pleurochaete squarrosa* (Bridel) Lindberg

RR, Rest (MI)

*Tortella inclinata* (Hedwig fil.) Limpricht

RR, Rest (MI)

Not previously recorded. Found by E.C. Wallace in Gozo in 1985.

*Tortula solmsii* (Schimper) Limpricht

RR, Rest (MED+MI)

*Weissia condensa* (Voit) Lindberg

R, Rest (MI)

(= *Hymenostomum tortile* (Schwaegrichen) Bruch, Schimper & Gumbel)

Rediscovered in 1977 prior to which record the only one available was that of Sickenberger in 1876 (Baur, 1891).

*Weissia wimmeriana* (Sendtner) Bruch, Schimper & Gumbel RR, Rest (MI)

#### Family: Funariaceae

*Entosthodon fascicularis* (Hedwig) C. Müller

RR, Rest (MI)

[Fasciculate Cord-moss]

Not found since 1876 when it was recorded by Sickenberger (Baur, 1891).

#### Family: Bryaceae

*Bryum argenteum* Hedwig var. *hirtellum* De Notaris  
[Silvery Thread-moss]

RR, Rest (MI)

*Bryum dunense* A.J.E. Smith & Whitehouse

I, Rest (MED)

This species has only been described in 1978 and is related to *B. bicolor* Dickson, which also occurs in Malta. First encountered in 1984.

*Bryum intermedium* (Bridel) Blandow

R, Rest (MI)

*Bryum mildeanum* Juratzka

R, Rest (MI)

*Bryum pallescens* Schleicher & Schwaegrichen  
(= *B. obconicum* Hornschuch)

R, Rest (MI)

*Bryum pseudotriquetrum* (Hedwig) Gaertner, Meyer & Schreber var.  
*bimum* (Schreber ap. Hedwig) Lilj

RR, Rest (MI)

Not found since 1876 when it was recorded by Sickenberger (Baur, 1891).

*Mniobryum wahlenbergii* (Weber & Mohr) Jennings  
(= *Pohlia wahlenbergii* (Weber & Mohr) Andr.)

R, Rest (MI)

First discovered in 1983 at Bahrija. The original site has been destroyed through habitat degradation.

**Family: Orthotrichaceae**

*Orthotrichum diaphanum* Bridel

RR, Rest (MI)

One of our very few epiphytic mosses. Not seen for several decades.

**Family: Thamnaceae**

*Thamnium cossyrense* Bottini var. *melifense* Bottini

●, RR, Rest (MI)

The typical form is endemic to Pantelleria while the variety is endemic to the Maltese Islands. I have not yet managed to locate living stands of this moss and it must be very rare.

**Family: Amblystegiaceae**

*Galliergonella cuspidata* (Dedwig) Loeske  
(= *Acrocladium cuspidatum* (Hedwig) Lindberg)  
[Pointed Bog Feather-moss]

RR, Rest (MI)

Recorded from Gozo. Has not been found for several years.

**Family: Brachytheciaceae**

*Brachythecium rutabulum* Bruch, Schimper & Gumbel  
[Rough-stalked Feather-moss]

RR, Rest (MI)

So far known only from Gozo.

*Eurynchium hians* (Hedwig) Sande Lac.  
(= *E. swartzii* (Turner) Curnow)  
[Pale Trailing Feather-moss]

RR, Rest (MI)

Associated with watercourses. Has been getting rarer due to habitat disturbance.

*Eurynchium schleicheri* (Hedwig filis.) Juratzka

RR, Rest (MI)

Not found for several decades.

*Eurynchium speciosum* (Bridel) Juratzka

R, Rest (MI)

First found in 1976. Usually associated with irrigation channels, sometimes as a submerged form.

*Isothecium striatulum* (Spruce) Kindberg RR, Rest (MI)  
 (= *Eurynchium striatulum* (Spruce) Bruch, Schimper & Gümbel)

Not found since 1876 when it was collected by Sickenberger (Baur, 1891).

*Rhynchostegiella curviseta* (Bridel) Limpricht RR, Rest (MI)

Not found for several decades.

## E. LICHENS

183 species of lichens have been listed by Sommier & Caruana Gatto (1915). These were largely collected by A. Caruana Gatto and identified by A. Jatta. No significant information has been published since. Malta's lichens still await a thorough investigation. In this list I am including only those lichens which have been described as new species from Maltese material and are presumably endemic. The names are being left exactly as published with no attempt at reallocation to alternative genera. No circumscribed Maltese name applies to lichens. Like Bryophytes, they are known as **HAŻIŻ** etc. I suggest using the term **LIKENI** when accurate reference to this group is required.

*Biatora fusco-nigrescens* Jatta ●

*Caloplaca marmorata* Bagl.  
 var. *cephaloidea* Jatta in Sommier & Caruana Gatto ●

*Caloplaca melitensis* Jatta ●

*Caloplaca pyracea* (Ach.) Th.  
 var. *lactea* Mass. forma *macrocarpa* Jatta ●

Described from Gozo.

*Collema meliteum* Jatta var. *conglomeratum* Jatta ●

*Graphina sophistica* Nyl.  
 var. *melitense* Jatta in Sommier & Caruana Gatto ●

*Lecaniella alocyza* Mass. var. *flavidula* Jatta ●

*Lecanora sublentigera* Jatta ●

*Lecidea pertusariicola* Jatta ●

*Scolicosporium dorise* Baglietto  
 var. *decussatum* Jatta ●

*Thalloedema mamillare* (Fr.) Mass.  
 var. *pulchella* Jatta ●

*Thalloedema paradoxum* Jatta ●



## F. FRESHWATER ALGAE

The nature of the Maltese freshwater wetlands do not favour the development of an extensive flora of macroscopic algae. Most of these are filamentous forms which for the most part have never been identified beyond the genus level. We do, however, have some species of interest and two merit inclusion in this compilation.

Division: CHAROPHYTA (Stoneworts)

Class: CHAROPHYCEAE

*Nitella flexilis* C. Agardh

X(?)

Not seen since many decades.

Division: RHODOPHYTA (Red Algae)

Class: BANGIOPHYCEAE (Lower Red Algae)

*Compsopogon coeruleus* (Balbis) Montagne

X, Rest (MED)

This was discovered in a freshwater canal at Marsa in 1977. Within a month from discovery, the whole freshwater community was obliterated as a result of alteration carried out on the water supply. The Maltese records constituted the fourth known European occurrence of this species (Battiatto et al., 1979).

Division: CYANOBACTERIA (Blue-green Algae)

Class: CYANOPHYCEAE

*Spelaeopogon sommieri* Borzi

1, Rest (MED+MI)

This interesting Blue-green Algae was first described by Borzi in Sommer (1908) from the island of Lampedusa. Borzi adds that in addition to Lampedusa, this species also occurs on Gozo from where it was collected by Sommer in 1907. It is not mentioned by Sommer & Ceruana Gatto (1915), evidently due to oversight. The genus seems to be endemic to S. Italy, Sicily and nearby islands.

## REFERENCES

- Armitage E. (1889) - Appunti sulla flora dell'Isola di Malta. - *Bull. Soc. Bot. Italiana*, 21: 495-500.
- Battiatto A.; Cormaci M.; Furnari G. & Lanfranco E. (1979) - The occurrence of *Compsopogon coeruleus* (Balbis) Montagne (Rhodophyta, Bangiophycidae) in Malta and of *Compsopogon chalybeus* Kützling in an aquarium at Catania (Sicily). - *Rev. Algol.*, N.S., 14: 11-16.

- Baumann H. (1977) - Eine bislang unbekannte *Ophrys sphecodes* - sippe auf den maltesischen Inseln. Die Orchideen der Rand gebiete des europäischen. - Florenbereiches; Die Orchidee, Sonderheit Dez. 1977: 64-69.
- Baur W. (1891) - Beiträge zur Laubmooseflora der Insel Malta. - *Hedwigia*, 30: 217-219.
- Boccone P. (1674) - *Icones et descriptiones rariorum plantarum Siciliae, Melitae, Galliae et Italiae*. London, xiii + 96pp.
- Borg G. [J.] (1909) - Nuove stazioni della *Melitella pusilla* Somm. nell'Isola di Malta. - *Bull. Soc. Bot. Italiana*, 1909: 102.
- Borg J. (1927) - *Descriptive flora of the Maltese Islands*. - Malta: Government Printing Office, 846 pp.
- Borg J. (1935) - A third supplement to the Descriptive Flora of the Maltese Islands. - *Archivum Melitense*, 9(4): 239-245.
- Botschantzev V. (1976) - Conspectus specierum sectionis *Coccossalsola* Fenzl generis *Salsola* L. - *Nov. Syst. Pl. Vasc.* (Leningrad), 13: 74-102.
- Briffa M. (1981) - The elm tree in Malta. - *Potamon*, 8: 95-96.
- Briffa M. (1986) - Two interesting additions to the flora of the Maltese Islands. - *Central Mediterranean Naturalist*, 1(4): 85-86.
- Briffa M. & Lanfranco E. (1986) - The macrofungi of the Maltese Islands: Additions and notes. - *Central Mediterranean Naturalist*, 1(4): 69-79.
- Brullo S. (1979) - Taxonomic and nomenclatural notes on the genera *Jasonia* Cass. and *Chiladenus* Cass. (Compositae). - *Webbia*, 34(1): 289-308.
- Brullo S. (1980) - Taxonomic and nomenclatural notes on the genus *Limolium* in Sicily. - *Botaniska Notiser*, 133: 281-293.
- Brullo S. (1984) - Taxonomic considerations on the genus *Darniella* (Chenopodiaceae). - *Webbia*, 38: 311-328.
- Brullo S. (1988) - Miscellaneous notes on the genus *Limolium* (Plumbaginaceae). - *Willdenowia*, 17: 11-18.
- Brullo S.; Lanfranco E. & Pavone P. (1982) - *Allium iofaconoi* sp. nov. e sue affinità con *Allium parviflorum* Viv. - *Webbia*, 35(2): 295-306.
- Brullo S.; Lanfranco E.; Pavone P. & Ronsisvalle G. (1988) - Taxonomical notes on the endemic flora of Malta. - *Giorn. Bot. Italiano*, 122, suppl. 1: 9.
- Brullo S. & Marcenò C. (1973) - *Crucianella rupestris* Guss. in Sicilia. - *Lavori Ist. Bot. Giard. Col. Palermo*, 25: 133-141.
- Brullo S. & Marcenò C. (1979) - *Dianthion rupicolae*, nouvelle alliance sub-Tyrrhenienne des *Asplenietea glandulosi*. - *Documents Phytosociologiques*, N.S., 4: 131-146.

Brullo S. & Pavone P. (1985) - Taxonomic considerations on the genus *Desmazeria* (Gramineae) with description of new species: *Desmazeria pignatti*. - *Willdenowia*, 15: 99-106.

Brullo S. & Pavone P. (1987) - *Cremnophyton lanfrancoi*: a new genus and species of Chenopodiaceae from Malta. - *Candollea*, 42: 621-625.

Brullo S. & Pavone P. (1988) - *Hyoseris frutescens*, a new species from Gozo (Malta). - *Candollea*, 43: 717-726.

Caruana Gatto A. (1925) - Primo contributo alla conoscenza dei zoocecidi delle Isole Maltesi. - *Archivium Melitense*, 7(3): 103-126.

Cesca G. (1969) - Ricerche citotassonomiche nelle Euphorbiaceae: *Euphorbia spinosa* L., *E. bignonae* Steud., *E. melitensis* Parl., *E. acanthothamnus* Heldr. et Sart. - *Giorn. Bot. Italiano*, 103(3): 205-263.

Cinelli F. (1976) - Alcune precisazioni sulla ecologia e sulla distribuzione di *Acetabularia parvula* Solms-Laubach (Chlorophyta, Dasycladales) nel Mediterraneo. - *Pubbl. Staz. Zool. Napoli*, 40: 260-262.

- Cinelli F. (1979) - *Acetabularia acetabulum* (L.) Silva, *Acetabularia parvula* Solms-Laubach and *Dasycladus vermicularis* (Scopoli) Krasser: ecology and distribution in the Mediterranean Sea. In: Bonotto, S.; Kefeli, V. & Puisseux-Pao, S. (eds) *Developmental Biology of Acetabularia*, pp. 3-14. Elsevier/North Holland Biomedical Press.

Council of Europe (1979) - *Convention on the conservation of european wildlife and natural habitats* ("Berne Convention"). - European Treaty Series no. 104.

Council of Europe (1982) - *List of rare, threatened and endemic plants in Europe*. - Nature & Environment series no. 27.

Den Hartog C. (1972) - Range extension of *Halophila stipulacea* (Hydrocharitaceae) in the Mediterranean. - *Blumea*, 20: 154.

Del Prete C.; Mazzola P. & Miceli P. (1984) - *Anacamptis urvilleana* Sommier et Caruana Gatto (Orchidaceae), una specie dimenticata delle Isole Maltesi. - *Giorn. Bot. Italiano*, 118, suppl. 2: 230.

Dia M.G.; Miceli G. & Not R. (1985) - Check-list delle epatiche note in Sicilia. - *Webbia*, 39(1): 163-177.

Dia M.G.; Miceli G. & Raimondo F.M. (1987) - Check-list dei Muschi noti in Sicilia. - *Webbia*, 41(1): 61-123.

Dostá J. (1975) - New nomenclatural combinations and taxa of the Composite subtribe Centaureinae in Europe. In: Heywood, V.H. (ed.) *Flora Europaea. Notulae systematicae ad Floram Europaeam spectantes*, no. 18. - *Bot. J. Linn. Soc.*, 71: 191-210.

Duthie J.F. (1874) - On the botany of the Maltese Islands in 1874, part 1. - *Journal of Botany British and Foreign*, 1874: 321-326.

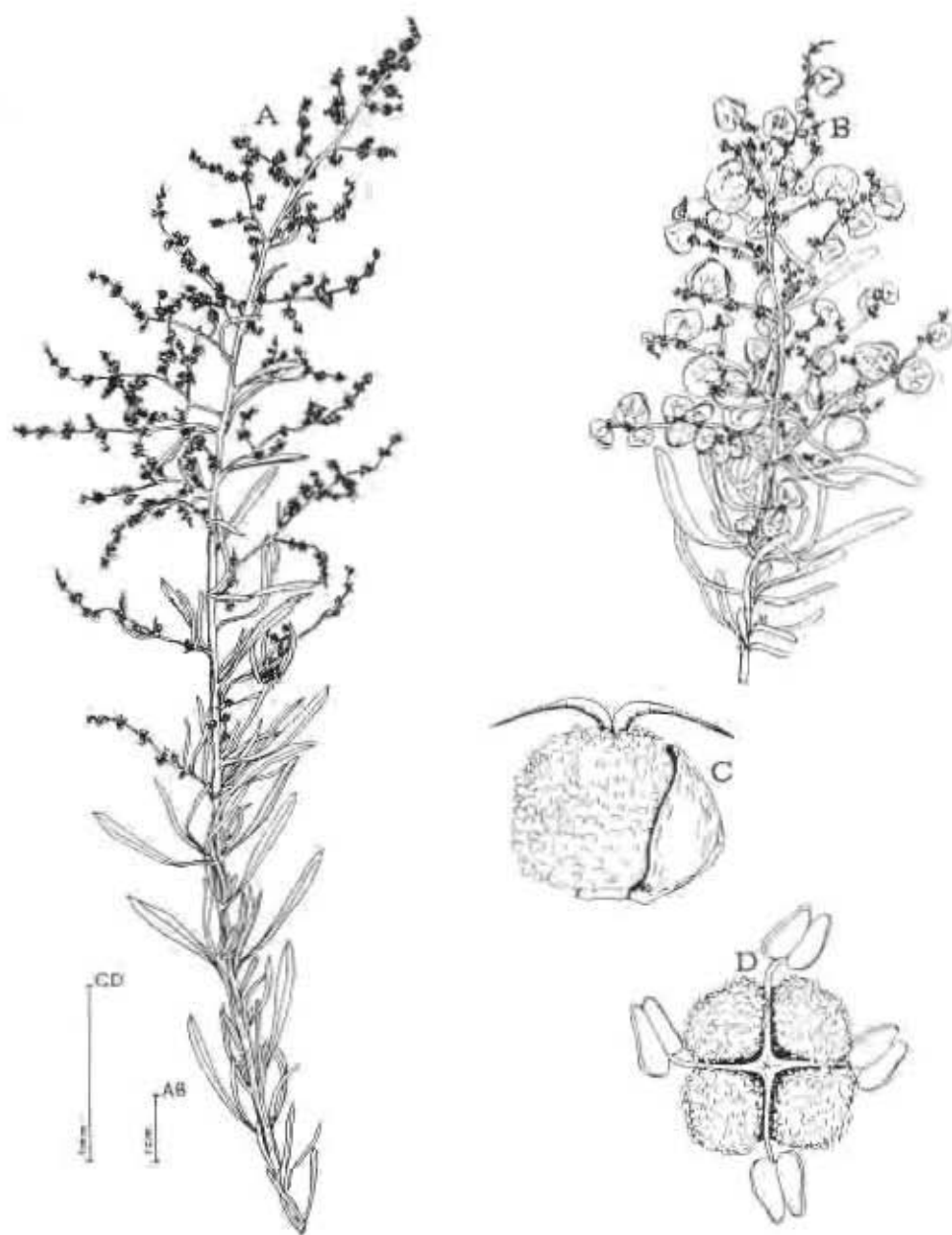
Duthie J.F. (1875) - On the botany of the Maltese Islands in 1874, part 2. - *Journal of Botany British and Foreign*, 1875: 36-42.



- Duthie J.F. (1875b) - Notes on the flora of the islands of Malta, Gozo, Comino and Cominotto. - *Il Barth*, Anno III: 542-544.
- Goldblatt P. (1980) - Systematics of *Gynandriris* (Iridaceae), a Mediterranean-southern African disjunct. - *Botaniska Notiser*, 133: 234-260.
- Gradstein S.R. (1972) - A note on the bryophytes of the Maltese Islands. - *Acta Botanica Neerl.*, 21(1): 67-70.
- Grech Delicata J.C. (1853) - *Flora Melitensis*. - Malta: xvi + 49pp.
- Gulia G. (1872) - Maltese botany: Callitrichineae. - *Il Barth*, Anno I: 116.
- Gulia G. (1872b) - Flora, Flora Maltese. In *Il Compagno per Tutti* ("Almanacco"), pp.64-72; Malta: Tipografia Anglo-Maltese.
- Gulia G. (1873) - Maltese botany: Najadaceae. - *Il Barth*, Anno II: 239.
- Gulia G. (1873b) - Maltese botany: Orchidaceae. - *Il Barth*, Anno II: 282-284.
- Gulia G. (1877) - Il Dottor Donaldson e la flora Maltese. - *Il Barth*, Anno IV: 134.
- Haslam S.M.; Sell P.D. & Wolseley P.A.W. (1977) - *A flora of the Maltese Islands*. - Malta University Press. lxxi + 560pp. Malta.
- Kramer K.U.; Westra L.Y.Th.; Kliphuis E. & Gadella Th.W.J. (1972) - Floristic and cytotaxonomic notes on the flora of the Maltese Islands. - *Acta Botanica Neerl.*, 21(1): 54-66.
- Lanfranco E. (1970) - The occurrence of *Halophila stipulacea* (Forsk.) Ascherson in Maltese waters. - *Maltese Naturalist*, 1(1): 16-17.
- Lanfranco E. (1971) - Some new flowering plants from Malta. - *Maltese Naturalist*, 1(2): 3-7.
- Lanfranco E. (1972) - Additions and corrections to the Maltese flora. - *Maltese Naturalist*, 1(3): 14-20.
- Lanfranco E. (1973) - Additions and corrections to the Maltese flora. - *Maltese Naturalist*, 1(4): 8-10.
- Lanfranco E. (1974) - Notes on the distribution of *Melitella pusilla* Sommier. - *Maltese Naturalist*, 1(6): 19-23 + 2 figs.
- Lanfranco E. (1975) - Some additions to the Maltese flora. - *Maltese Naturalist*, 2(2): 47-48.
- Lanfranco E. (1975b) - *Acetabularia moebii* Solms-Laubach (Chlorophyta - Dasycladaceae) in Maltese waters. - *Maltese Naturalist*, 2(2): 49.
- Lanfranco E. (1981) - *Suggestions on the conservation of the unique flora associated with the Gozo Citadel*. - Malta: Society for the Study and Conservation of Nature.



- Lanfranco E. (1983) - The flora of St. Paul's Island. - *Potamon*, 11: 23-31 + 2 plates.
- Lanfranco E. (1984) - Looking at plants, 12: Galis. - *Potamon*, 11: 58-61 + plate.
- Lanfranco G. (1961) - *Cynomorium coccineum*, A Maltese historical plant. - *Melita Historica*, 3(1): 53-70.
- Lanfranco G. (1974) - *Hydroclathrus clathratus* (Bory) Howe. - *Maltese Naturalist*, 1(5): 22-23.
- Massalongo C. (1913) - Nuovi rappresentanti nella flora Italica del genere *Riccia*. - *Bull. Soc. Bot. Italiana*, 1913(2-3): 50-53.
- Metcalf C.R. (1966) - Appendix V. Report on the Botanical determination of charcoal samples. In Trump, D.H. *Skorba excavations carried out on behalf of the National Museum of Malta 1961-63. Report of the Research Committee of the Society of Antiquaries of London* p. XXII; Oxford.
- Minissale P. & Spampinato G. (1987) - Segnalazioni di piante nuove per la flora di Lampedusa. - *Inform. Bot. Italiano*, 19(2): 136-143.
- Möebius M. (1892) - Enumeratio algarum ad insulam Maltam collectarum. - *La Notarisia*, 7: 1436-1449.
- Nardi E. (1984) - The genus *Aristolochia* L. (Aristolochiaceae) in Italy. - *Webbia*, 38: 221-300.
- Nyman C.F. (1844) - Observationes in Floram Siculam. - *Linnaea*, 18: 625-663.
- Parlatore F. (1852) - *Flora Italiana*, vol. 2 - Firenze, 220pp.
- Pignatti S. (1982) - *Flora d'Italia*, 3 vols. Bologna: Edagricole.
- Silverwood J.H. (1971) - Maltese flora - recent additions and notes. - *Maltese Naturalist*, 1(2): 8-10.
- Sommier S. (1907) - Un gioiello della flora Maltese. Nuovo genere e nuova specie di Composte. - *Nuovo Giorn. Bot. Italiano* (n.s.), 14: 496-505 + Tab. xiv.
- Sommier S. (1908) - *Le isole Pelagie, Lampedusa, Linosa, Lampione e la loro flora, con un elenco completo delle piante di Pantelleria*. - Firenze: Stab. Pellas, 345pp.
- Sommier S. & Caruana Gatto A. (1915) - *Flora Melitensis Nova*. - Firenze: Stab. Pellas. viii + 502pp.
- Vuille F.L. (1987) - Reproductive biology of the genus *Damasonium* (Asteraceae). - *Plant Systematics and Evolution*, 157: 63-71.
- Wayfarer (1976) - *Iris pseudopumila*. - *Maltese Naturalist*, 2(3): 61.
- Zammit Maempel O. (1977) - *An outline of Maltese geology*. - Malta, 44pp.



*Zerapha S.* (1827) - *Flora Melitensis Thesaurus*, fasc. 1. - Valletta, iv + 36pp.

A = flowering branch; B = fruiting branch; C = 'single' flower; D = 'magnified' flower. (from Brullo & Pavone (1987) *Cardologia* 42:1987).

# INVERTEBRATES OTHER THAN INSECTS AND MOLLUSCS

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## INTRODUCTION

The list below is based on the author's own observations, on correspondence with specialists who have worked on the Maltese fauna and on literature surveys. It is by no means complete but rather provides a summary of information available to date. There are whole groups of invertebrates which occur in the Maltese Islands but about which very little is known (e.g. Araneae, Chilopoda, freshwater Crustacea). These groups are, however, expected to include rare, endemic or threatened species. The exclusion of certain groups from the list should therefore be interpreted as reflecting a lack of knowledge rather than actual status.

## SPECIES LIST

Phylum: CNIDARIA  
Class: Anthozoa  
  
Order: Gorgonacea

*Corallium rubrum* (Linnaeus) R, Rest (MED+MI)  
[Red or Precious Coral; Maltese: Qroll Ahmar]

Mediterranean Red Coral populations have a long history of overcollecting and have declined dramatically throughout much of the region. In the Maltese Islands, Red Coral occurs at depths of 120-500m and has recently started to be fished for the manufacture of jewellery.

Order: Madreporaria (= Scleractinia)

*Cladocora caespitosa* (Linnaeus) R  
[Stony Coral; Maltese: Qroll]

This stony coral forms colonies attached to rocky substrata at depths of 5-50m. Although a common Mediterranean species, it is often collected, dried and bleached for sale as a souvenir or as a decoration for aquaria. Since this species is relatively slow-growing, indiscriminate collecting could lead to its becoming rare in certain localities.

Order: Antipatharia

*Antipares* spp. R, Rest (MED+MI)  
[Black Coral; Maltese: Qroll Iswed]

At least two species occur at depths of 500-600m off the coast of Malta. One of these has recently started to be fished for the manufacture of



jewellery. The extent of the local coral beds is not known but because all antipatharians are very slow-growing, they are highly susceptible to overfishing and have been included in the IUCN's Invertebrate *Red Data Book* as 'commercially threatened'; they are also included in Appendix II of CITES.

Phylum: ANNELIDA  
Class: Hirudinea

*Haemopsis sanguisuga* (Linnaeus) V, Rest (MI-Gozo)  
[Horse Leech; Maltese: Sangisug]

So far this is the only species of leech reported to occur on the Islands and is known only from a single locality in Gozo: the permanent freshwater spring at Xlendi Valley (Schembri, 1985), part of which is now under threat from dumping of building waste. *H. sanguisuga* is a predaceous species. A second species, ectoparasitic on the local frog, may also occur and is under study (E. Lanfranco & P. J. Schembri, unpublished results).

Phylum: CHELICERATA  
Class: Arachnida

Order: Pseudoscorpiones [False Scorpions]

*Chthonius (Ephippiochthonius) maltensis* Mahnert  
●, R(?), Rest (MI) (?)

This recently described species of False Scorpion has to date been found only in the Maltese Islands where it is known from Malta: Il-Karraba (the type locality) and Fomm ir-Rih, and Gozo: Dwejra Point (Mahnert, 1975).

*Chthonius (Ephippiochthonius) girgentiensis* Mahnert  
● (Malta only?), 1, Rest (MI)

This new and apparently endemic species of False Scorpion has to date been found only in a cave at Girgenti (Mahnert, 1982).

*Roncus melitensis* Giardini & Rizzerio  
● (?), E, Rest (MI)

A very recently described species of cavernicolous False Scorpion, to date known only from two females collected from Ghar il-Frilefet Cave at Birżebbuġa (Giardini & Rizzerio, 1987). This cave is under threat of having its entrance blocked due to building works being carried out in the area.

Order: Palpigradi [Microwhipscorpions]

*Eukoeneria christiani* Condé ● (Malta only?), 1, Rest (MI)

This species, the only member of the order known from the Maltese Islands, was only very recently described on the basis of a single specimen from a cave at Girgenti (Condé, 1988) and is to date known only from this locality.





(a) Maltese populations of the Mediterranean Freshwater Crab, *Potamon fluviatile*, are a distinct, endemic subspecies. (Photo: P. J. Schembri).



(b) Maltese species of the Door-snail, *Lampedusa*; from left to right: *L. macrostoma*, *L. oscitans*, *L. scalaris*, *L. mamotica*, *L. melitensis*, *L. imitatrix*. (Photo: P. J. Schembri).

Order: Araneae (Spiders; Maltese: Brimbi)

(\*) *Nemesia arboricola* Pocock  
[Tree Trapdoor-spider]

●(?), I

A large, apparently tree-dwelling, Trapdoor Spider described from specimens collected from Malta (exact locality unknown) (Pocock, 1903) and not recorded again since.

*Tetragnatha extensa* (Linnaeus)

R, Rest (MI)

*Argiope bruennichi* (Scopoli)

R, Rest (MI)

Both are large spiders with a restricted distribution in the Maltese Islands. The first is associated with wetland habitats and locally has been found only at Salina, Ghadira and Il-Magħluq at Marsaskala (Malta); the other is associated with watercourses and has been found only at Wied il-Luq, Buskett (Malta) (E. Lanfranco, personal communication).

*Aelurillus schembrii* Cantarella

I, Rest (MED)

[Jumping Spider; Maltese: Brimba Qabbeżija ta' Schembri]

A recently described Jumping Spider endemic to Sicily and the Maltese Islands. The type locality is iċ-Ĉumnija (Malta) (Cantarella, 1982).

*Neaetha membroso* (Simon)

R, Rest (MI)

[Jumping Spider; Maltese: Brimba Qabbeżija]

A Jumping Spider locally known only from two specimens from Salina (Malta) (Cantarella, 1982), one of the few remaining saline marshlands in the Maltese Islands and suffering extensive disturbance.

Phylum: CRUSTACEA

Class: Branchiopoda

Order: Anostraca

*Branchipus schaefferi* Fisher

Rest (MI)

*Branchipus visnyai* Kertész

RR, Rest (MI-Gozo?)

[Fairy Shrimps; Maltese: Gambli ta' l-Għadaġġar]

The only species of Fairy Shrimp recorded to date is *Branchipus stagnalis* L. (Baldacchino, 1983). This is now known to be a misidentification and two species occur (author's unpublished results). Both are found in temporary rainwater pools, a transient and vulnerable habitat. *B. schaefferi* is common where found but has an overall patchy distribution in the Maltese Islands; *B. visnyai* is so far known only from a single locality in Gozo (Wied ir-Raheb).

Order: Conchostraca

(?) *Eocyclus* cf. *orientalis* Daday

Rest (MI)

[Clam Shrimp]



This is the only species of Clam Shrimp recorded to date from the Maltese Islands (Baldacchino, 1983), however, all Clam Shrimps studied during a recent survey were *Cyzicus tetracerus* (author's unpublished results). It is likely that only the latter species occurs and the records of *Eocyclus* cf. *orientalis* are misidentifications. The local species of Clam Shrimp lives in the same habitat as *Branchipus schaefferi* and the same comments apply.

Order: Notostraca

(\*) *Limnodia melitensis* Gullia

●(?), 1

*Triops cancriformis* (Bosc)

R, Rest (MI)

[Tadpole Shrimps]

The first is a species of Tadpole Shrimp reported by Gullia (1873), however, no further information is available and its taxonomic validity and status are unknown. The second species is a large Tadpole Shrimp which lives in shallow, muddy, temporary rainwater pools in a few localities only. Destruction of habitat through dumping of soil and waste, and through the land being diverted for building purposes, is adversely affecting this species.

Class: Ostracoda

(\*) *Krithe* n. sp. B

Rest (MED) (?)

(\*) *Polycope* n. sp. 3

Rest (MED) (?)

These species of marine ostracods have been recorded from off the coast of Malta (Bonaduce & Masoli, 1970) but their status is unknown.

Class: Malacostraca

Order: Isopoda [Woodlice; Maltese: 'niezer l-Art]

*Speiazoniscus vallettae* Caruso

●, RR, Rest (MI)

This endemic woodlouse has been found at Dwejra, Gozo (type locality) where it occurs under stones close to the shore (Caruso, 1975) and at Mistra Bay, Malta (Caruso & Lombardo, 1982).

*Armadillidium aelleni* Caruso & Ferrara

●, RR, Rest (MI)

A recently described species of cave-dwelling woodlouse which has been found only at Ghar Hasan Cave, Malta (type locality) (Caruso & Ferrara, 1982) and in a cave at Girgenti (Caruso & Lombardo, 1982). In these caves it is however quite common (Schembri & Gauci, 1984). This species has very recently also been found in a cave in Gozo (C. Hill, personal communication).

*Armadillidium schmalzfussi* Caruso & Lombardo

●

*Bathytropa schembrii* Caruso & Lombardo

● (Malta only?), RR (?)

Two recently described and endemic species of woodlice (Caruso & Lombardo, 1982). The first is common all over the Maltese Islands (type locality; Ġnejna, Malta); the second is so far known only from Malta where it has been found at Attard and Buskett (type locality) (Caruso & Lombardo, 1982) and more recently from Il-Maqluba near Qrendi (C.Hill, personal communication), but is apparently common in these localities.

*Miktoniscus melitensis* Caruso & Lombardo

RR(?), Rest (MED)

A species originally described from Malta (type locality: Ghallis) but recently also found in one station in Sicily (Caruso et al., 1987). In the Maltese Islands this species appears to be very rare.

*Trichoniscus matulicli* Verhoeff

E, Rest (MI)

A cave-dwelling woodlouse locally known only from Ghar il-Friefet Cave, Birżebbuġa, Malta (Caruso & Lombardo, 1982). This cave is threatened by building works taking place over the entrance.

**Order:** *Amphipoda* [semi-terrestrial species: Sandhoppers; Maltese: Brieghet ta' l-Alka or Brieghet tar-Ramell]

*Echinogammarus ebusitanus* (Margalef) V, Rest (MI-Gozo)

A species of semi-terrestrial amphipod locally apparently restricted to the island of Gozo where it occurs in a single valley system (Wied il-Lunzjata/Xlendi Valley) where it is associated with permanently flowing freshwater, a habitat type very rare in the Maltese Islands (Moore & Schembri, 1986).

*Echinogammarus pungens* (Milne Edwards) V, Rest (MI-Malta)

First recorded by Baldacchino (1983) from Mtarfa and Bahrija Valley. A recent survey (Moore & Schembri, 1986) has shown that within the Maltese Islands, this species is limited to these two sites only where it associates with permanently flowing freshwater.

*Gammarus aequicauda* (Martynov) R, Rest (MI-Malta?)

A brackish-water species to date locally known only from the saline marshlands of Salina and Ghadira (Nature Reserve) (Moore & Schembri, 1986).

*Rhipidogammarus rhipidophorus* (Catta)

RR, Rest (MI-Gozo)

This species is very interesting in that it inhabits subterranean flowing water - the only species from this habitat type known so far from the Maltese Islands. It has been found in a single underground spring at Fontana, Gozo (Moore & Schembri, 1986).

*Eriopisa gracilis* Ruffo & Schiökke 1, Rest (MED) (?)

A small marine amphipod described on the basis of nine specimens collected from a depth of 5m some 0.5km off St. Paul's Bay and so far apparently known only from there.



Order: Decapoda

*Potamon fluviatile* (Herbst) n.spp. ●, E. Rest (MI)  
[Maltese Freshwater Crab; Maltese: Qabru, Grant ta' l-  
Ilma Helu]

This is the only species of freshwater crab in the Maltese Islands. Long thought to be similar to other Mediterranean populations of this species, a recent study (Capolongo & Cilia, in press) has shown that the Maltese populations form a distinct, endemic subspecies. The Maltese Freshwater Crab occurs only along permanent or near-permanent springs and because of the dearth of such habitats in the Maltese Islands, it is becoming very rare. The situation is further aggravated by senseless collecting by parties of children and unless protected, this species will soon become extinct (N.H.S.M., 1975; Pace *et al.*, 1976; Savona Ventura, 1979; Schembri, 1983).

Phylum: UNIRAMIA

Class: Diplopoda [Millipedes; Maltese: Hniex ta' l-Indewwa]

Order: Glomerida

*Glomeris distichella* Berlese Rest (MED)

A common species of pill-millipede occurring in leaf litter accumulating under trees and shrubs (Enghoff & Schembri, 1989). Apart from the Maltese Islands, it is known only from Sicily and the Egadian Islands.

Order: Polydesmida

*Stosatea minima* Strasser Rest (MED)

A species of biogeographical interest but which is not uncommon in the Maltese Islands. It was first described from northwest Greece in 1976; the Maltese record (Enghoff & Schembri, 1989) is only the second one for the species which therefore represents an eastern (Balkan) element in the Maltese fauna.

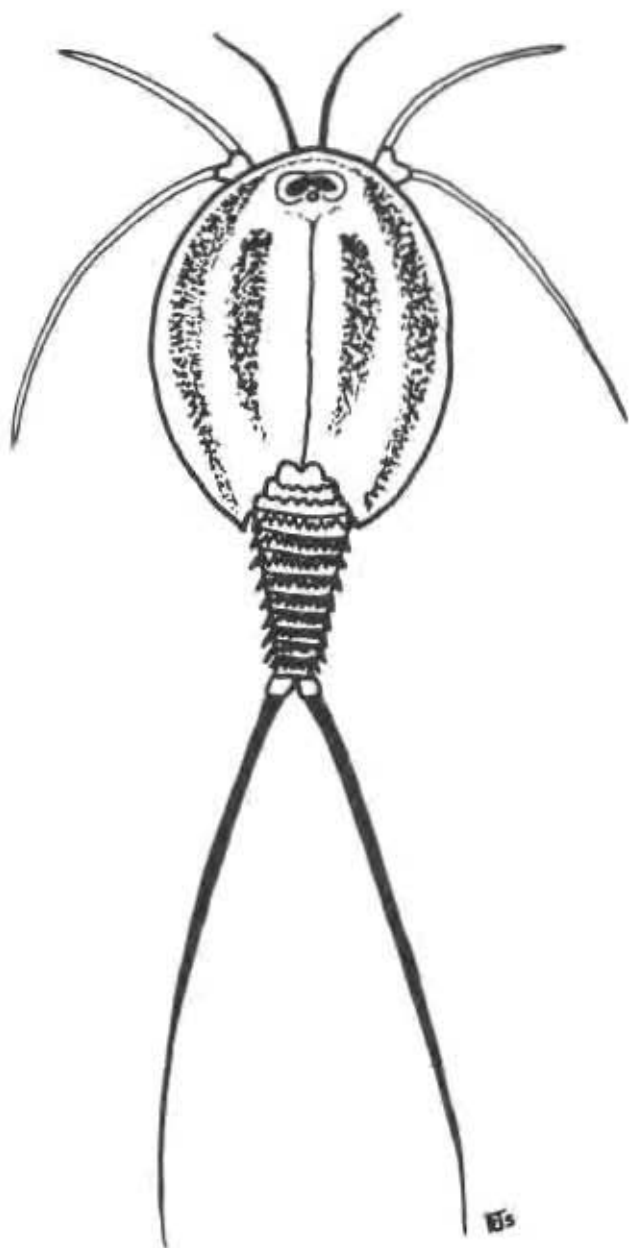
## REFERENCES

- Baldacchino A.E. (1983) - A preliminary list of freshwater crustaceans from the Maltese Islands. - *The Central Mediterranean Naturalist*, 1(2): 49-50.
- Bonaduce G. & Masoli M. (1970) - Benthic marine Ostracoda from Malta. - *Pubbl. Staz. Zool. Napoli*, 38: 47-56.
- Canterella T. (1982) - Salticidae (Araneae) delle isole Maltesi. - *Animalia*, 9(1/3): 239-252.
- Capolongo D. & Cilia J.L. (in press) - *Potamon fluviatile lanfrancoi*, a new subspecies of the Mediterranean freshwater crab from the Maltese Islands (Crustacea, Decapoda, Potamidae). -
- Caruso D. (1975) - *Spelaeoniscus vallettae*, nuova specie di isopodo terrestre dell'isola di Gozo. - *Animalia*, 2(1/3): 59-66.

- Caruso D.; Baglieri C.; Di Maio M.C. & Lombardo B.M. (1987) Isopodi terrestri di Sicilia ed isole circumsiciliane (Crustacea, Isopoda, Oniscordea). *Animalia*, 14 suppl., 211 pp.
- Caruso D. & Ferrara F. (1982) - *Armadillidium aelleni* new species of terrestrial isopod from a cave in Malta. - *Rev. Suisse Zool.*, 89: 809-814.
- Caruso D. & Lombardo B.M. (1982) - Isopodi terrestri delle isole Maltesi. - *Animalia*, 9(1/3): 5-52.
- Condé B. (1988) Nouveaux Palpigrades de Trieste, de Sloénie, de Malte, du Paraguay, de Thaïlande et de Bornéo. *Rev. Suisse Zool.*, 95: 723-750.
- Enghoff H. & Schembri P.J. (1989) - The millipedes (Diplopoda) of the Maltese Islands (Central Mediterranean). - *Boll. Soc. Ent. Ital.*, 120: 164-173.
- Gardini G. & Rizzetto R. (1987) - I *Roncus* eucavernicoli del gruppo *siculus* (Pseudoscorpionida Neobisifidae). - *Boll. Soc. Ent. Ital.*, 119(2): 57-80.
- Gulia G. (1873) - Fauna maltese: Indice dei crostacei. - *Il Barth*, 15/16: 314-315.
- Mahnert V. (1975) - Pseudoskorpione von den Maltesischen Inseln. - *Fragments Ent.*, 11: 185-197.
- Mahnert V. (1982) - Neue hohlenbewohnende Pseudoskorpione aus Spanien, Malta und Griechenland (Arachnida, Pseudoscorpiones). - *Mitt. Schweizer Ent. Gesell.*, 55: 297-304.
- Moore P.G. & Schembri P.J. (1986) - Notes concerning the semi-terrestrial and freshwater amphipods (Crustacea: Peracarida) of the Maltese Islands. - *Animalia*, 13(1/3): 65-75.
- Natural History Society of Malta (1975) - *A petition for the protection of the freshwater crab in Malta*. - Malta: N.H.S.M., 4pp.
- Pace F.; Harris R.R. & Jaccarini V. (1976) - The embryonic development of the Mediterranean freshwater crab, *Potamon edulis* (= *P. fluviatile*) (Crustacea, Decapoda, Potamonidae). - *J. Zool., Lond.*, 180: 93-106.
- Pocock R.I. (1903) - Description of four new Arachnida of the orders Palpigradi, Solifugae and Araneae. - *Ann. Mag. Nat. Hist.*, ser. 7, 11: 220-226.
- Ruffo S. and Schiecke U. (1975) - Descrizione di *Eriopisa gracilis* n.sp. (Amphipoda, Gammaridae) delle coste di Malta e ridescrizione di *E. coeca* (S. Karaman, 1955) (= *E. peresi* M. Ledoyer, 1968). - *Boll. Mus. Civ. St. Nat. Verona*, 2: 415-438.
- Savona Ventura G. (1979) - *Potamon edulis* (Latr.), the freshwater crab. - *Potamon*, 1: 1.
- Schembri P.J. (1983) - The Mediterranean freshwater crab: 'il-qabru'. - *Civilization*, 7: 182-183.

Schembri P.J. (1986) - A note on non-marine leeches (Annelida: Hirudinea) from the Maltese Islands. - *The Central Mediterranean Naturalist*, 1(4): 81-83.

Schembri P.J. & Gauci M. (1984) - Observations on the population of *Armadillidium aelleni* at Ghar Hasan. - *Potamon*, 12: 51.



*Triops cancriformis*

# MOLLUSCA

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## INTRODUCTION

Apart from some insect groups, the Mollusca are perhaps the best known of local invertebrates, both scientifically, since they have been amongst the earliest of local animals to be studied by naturalists, and also by lay people since their colourful and strangely shaped shells attract attention. Additionally, many molluscs are edible and some are considered delicacies. These factors have contributed to cause some species populations to decline due to overcollecting either as items of food or as specimens for collections; this is especially true in the case of some marine species as will be detailed in the species list below. The terrestrial, freshwater and brackish-water malacofauna suffers from a different, but much more serious, kind of threat: habitat destruction. This has already caused the extinction of some species while others are in a very precarious state, particularly those endemic forms which occupy areas of a few tens of square metres only.

The scientific and cultural importance of the local non-marine malacofauna cannot be overstressed. Many forms are endemic and most of these bear the names of the famous pioneering Maltese naturalists who first discovered them. Over and above this, some groups, particularly the Door Snails (family Clausiliidae) of the genus *Lampedusa* and the Top Snails (family Hygromiidae) of the genus *Trochoidea*, occur locally as a complex mosaic of species, subspecies, hybrid forms and ecotypes, mostly endemic to the very small areas they occupy, and making ideal subjects for the study of evolutionary processes at work. These snails are also very important in throwing light on the evolution and zoogeography of the groups on a regional (Mediterranean) level, while a recent study of the local Door Snails (Thake, 1985) has gone a long way in elucidating the biogeography of the Maltese Islands.

In the species list which follows, the nomenclature for marine species follows the system of Piani (1980 and supplements). For the non-marine species, some explanation of the nomenclature used is necessary. Many local species were originally described on the basis of shell morphology alone, a character now known to be very unreliable in delimiting species. Anatomical studies of the soft parts, pioneered for local forms by Soós (1933), have resulted in a reappraisal of many of the 'classical' species and the recognition of new ones. Unfortunately, not all local forms have been studied anatomically or even to the same level of detail, and moreover, few comparisons with type material and with material from other geographical regions have been made. This has resulted in a confused nomenclature and a plethora of names applied to



entities of uncertain taxonomic status. In an attempt to sort out this confusion and to elucidate the evolutionary and zoogeographical relationships of certain groups, Folco Giusti and his coworkers have undertaken a critical re-examination of the Maltese terrestrial, freshwater and brackish-water forms based on conchological, anatomical and allozymic characters as well as comparisons with type material. The nomenclature used in the following species list is a provisional one based on the preliminary results of these studies (F. Giusti and G. Manganello, personal communication).

## SPECIES LIST

Class: AMPHINEURA  
Subclass: Polyplacophora  
Order: Isoplocophora  
Family: Acanthochitonidae

*Acanthochitona oblonga* Leloup Rest (MED)?  
[Coat-of-Mail Shell, Maltese: Hanzir il-Bakar]

A species of chiton first described by Leloup (1981) from material collected from Salina Bay (type locality) (Thake & Schembri, 1978). It was originally thought to be endemic to the Maltese Islands but this species is now known to occur also along the coasts of Tunisia and Italy (Dell'Angelo & Cuppini, 1983) and the Adriatic (Ruggiero, 1983).

Class: GASTROPODA  
Subclass: Prosobranchia  
Order: Archaeogastropoda  
Family: Trochidae

*Gibbula (Colliculus) nivosa* A. Adams ●, V, Rest (MED+MI)  
[Maltese Top-shell; Maltese: Gibbula ta' Malta]

Possibly the only endemic species of marine mollusc to occur in the Maltese Islands. Overcollecting by conchologists might endanger this species in the near future, especially since it is now being featured in the catalogues of professional shell dealers (Schembri, 1985).

Order: Mesogastropoda  
Family: Cymatiidae

*Argobuccinum (Ranella) olearium* (Linnaeus) R

*Cymatium (Cabestana) cutaneum* (Linnaeus) R

*Cymatium (Septa) parthenopus* (Von Salis) R

*Cymatium (Septa) corrugatum* (Lamarck) R, Rest (MED)

*Charonia rubicunda* (Perry) R

*Charonia tritonis variegata* (Lamarck) R



(a) In the Maltese Islands the Damselfly *Ischnura genei* is restricted to areas with freshwater. (Photo: J. M. Mangion).



(b) The summer brood of the Small Copper Butterfly, *Lycaena phlaeas*, is dependent on the Wild Thyme. (Photo: P. J. Schembri).

The species listed above, which include the Triton Shells (Maltese: Bronja) and their relatives, are all large shells now rare both locally and in the Mediterranean as a whole. They are much sought after by shell collectors and are often sold as curios and souvenirs making them susceptible to overcollecting.

**Family: Velutinidae**

*Lamellaria perspicua* (Linnaeus)

V

**Family: Eratoidae**

*Erato voluta* (Montagu)

RR, Rest (MED)

*Pusula candidula* (Gaskoin)

R

**Family: Cypraeidae**

*Schilderia achatidae* (Gray in G.B. Sowerby)

RR, Rest (MED)

*Zonaria pyrum* (Gmelin in Linnaeus)

RR

**Family: Ovulidae**

*Pedicularia sicula* Swainson

RR, Rest (MED)

*Pseudosimnia carnea* (Poirat)

RR

*Neosimnia spelta* (Linnaeus)

RR, Rest (MED)

The above species of Cowries (Maltese: Bahbuħ) and allied shells are rare in Maltese waters (Lanfranco, 1977) and are much sought after by shell collectors making them susceptible to overcollecting.

**Family: Hydrobiidae**

*Pseudamnicola melitensis* (Paladilhe)

●, E, Rest (MI)

*Mercuria cf. similis* (Draparnaud)

E, Rest (MI)

Two species of small freshwater Spire-snails (Maltese: Bebbux ta' l-ilma Melu) one of which is endemic. Both are limited to valleys draining permanent springs or otherwise with an abundant supply of freshwater. The overall dearth of such habitats in the Maltese Islands and the continuing disruption in those localities supporting populations of these species, is endangering them.

*Ventrosia ventrosa* (Montagu)

V, Rest (MI)

*Hydrobia acuta* (Draparnaud)

E, Rest (MI)

*Heleobia stagnorum* (Gmelin)

E, Rest (MI)

Three species of small brackish-water Spire-snails (Maltese: Bebbux ta' l-Iima Salmastru) which, because of the similarity of their shells and the variability in shell morphology, have often been confused with each other and with other species and recorded under different names in the Maltese malacological literature (e.g. *Hydrobia musaensis*, *Hydrobia ulvae*).

All three species occur in large populations where found but have an overall very restricted distribution in the Maltese Islands since they occur in the brackish-water collecting in saline marshlands, a habitat type found in a few scattered localities. *Ventrosia ventrosa* is currently known to occur at Ghadira (the nature reserve) and at Salina; *Hydrobia acuta* at Il-Ballut in Marsaxlokk and at Salina; and *Heleobia stagnorum* only at Salina. A population of the last named species used to occur at Marsa, but this is now extinct due to the dumping of industrial waste into the brackish-water canal where this species used to live.

Family: Thiariidae

*Melanoides tuberculata* (Müller)

E(?), Rest (MI)

An indigenous population of this handsome species used to occur in a small spring exiting into Salina Bay in the Ta' Mattew area. Building development in the area has completely obliterated this stream and the biota it supported. Because of its popularity with aquarists, non-indigenous populations may still be found in the Maltese Islands.

Family: Pomatiidae

(\*) *Pomatias sulcatus melitense* (Sowerby)

●(?)

[Round-mouthed Snail; Maltese: Bebbux ta' Fossal]

A very common species probably not different from other western Mediterranean populations (F. Giusti, personal communication).

Subclass: Pulmonata

Order: Basommatophora

[Family: Ellobiidae

*Ovatella kobelti* (Caruana Gatto)

A species originally described in 1890 by the pioneering Maltese naturalist Alfredo Caruana Gatto from Il-Ballut at Marsaxlokk (type locality). It is now known that this supposedly endemic species is actually a misidentification of *Auriculina bidentata* (Sammut et al., in press) and it is included here merely for its historical interest.]

Family: Lymnaeidae

*Lymnaea (Radix) peregra* (Müller)

X(?), Rest (MI)

[Wandering Snail]



The collection of the late C.Thake contains some old shells from Chadwick Lakes. This species has not been found recently and may be extinct from the islands.

*Lymnaea (Stagnicola) palustris* (Muller) X(?), Rest (MI)  
[Marsh Snail]

Another freshwater snail now probably extinct from the Maltese Islands as it has not been found recently. A population of what apparently was this species used to occur at Wied is-Sewda but this has now disappeared due to the excavation and damming of the valley as part of the 'Risq il-Widien' project.

*Lymnaea (Galba) truncatula* (Muller) V(?), Rest (MI)  
[Dwarf Pond-snail; Maltese: Bebbuxu ta' l-Ilma Helu]

Possibly the commonest and most widespread local freshwater snail. It occurs in valleys with an abundant supply of water but it is still vulnerable since there are not many of these in the Maltese Islands and most are suffering extensive disturbance.

Family: Physidae

*Physella acuta* (Draparnaud) V, Rest (MI)  
[Bladder Snail; Maltese: Bebbuxu ta' l-Ilma Helu]

Restricted to a few valleys with an abundant supply of freshwater, the largest populations occurring at Chadwick Lakes. The Maltese populations of this species have often been described as distinct endemic forms by the early Maltese naturalists (e.g. *Physa melitensis* Mamo and *Physa gattol* Gullia) but there is no evidence to support this separation.

Family: Planorbidae

*Planorbis* sp. V, Rest (MED+MI)  
[Ram's Horn Shell; Maltese: Bebbuxu ta' l-Ilma Helu]

A number of planorbid snails have been recorded from the Maltese Islands under a variety of names including: *Planorbis marginatus*, *P. subangulatus*, *P. planorbis* and *Gyraulus laevis*. Only one species has been found by the authors and this corresponds to none of the forms named above but shows affinities with a species present in Corsica, Sardegna and a few Italian localities (P.Giusti, personal communication). It is likely that all previous records refer to this one species although the possibility that other species occurred but are now extinct cannot be excluded. It should also be noted that a number of exotic species have been introduced into public and private gardens and these often 'escape' and establish populations in the wild (e.g. a species of *Helisoma* at Wied il-Luq in Buskett). This may be an additional factor contributing to the confusion about the number and identity of the local planorbids.

Order: Stylommatophora  
Family: Limacidae

*Lehmannia mellitensis* (Lessona & Pollonera)      ●(?), 1  
[Maltese Keelback Slug; Maltese: Bugharwien ta' Malta]

Originally thought to be endemic to the Maltese Islands, this slug probably occurs also in Sicily and other circumsicilian islands (F. Giusti, personal communication). Locally it appears to be relatively rare.

Family: Agriolimacidae

*Deroceras golcheri* (Van Regteren Altena)  
[Golcher's Keelback Slug; Maltese: Bugħarwien ta' Golcher]

A species first described from Il-Magħluba, near Qrendi (type locality). It is however quite widespread in the Maltese Islands.

Family: Ferussacidae

*Gecillioides* sp. 1  
[Blind Snail]

A number of species of *Cecillioides* have been recorded from the Maltese Islands including three supposedly endemic ones: *C. gattol*, *C. polloneræ* and *C. melitensis*. All possibly refer to one widely distributed and highly variable species, *Cecillioides acicula*; this view has been partly confirmed by an examination of type material (F. Giusti, personal communication). While these snails are not often encountered, their rarity may be more apparent than real since it may be due to their small size and subterranean habits.

genus near *Hohenwartiana* RR, Rest (MED+MI)?

A recently discovered species which is currently under study. Whatever its taxonomic status, it is very rare in the Maltese Islands having to date been found only on the coastal clay slopes of the Selmun area and Ghajn Tuffieha, where it is present in very low numbers.

Family: Clausiliidae

The Clausiliidae (Door Snails) are represented in the Maltese Islands by two genera, *Papillifera* and *Lampedusa*. The last named is endemic to the central Mediterranean where it is confined to southeastern Sicily, the Maltese Islands and the Pelagian Islands. The systematics, taxonomy and biogeography of this genus have been the subject of numerous studies, of which the most important are the works of Soós (1933), Zilch (1977), Nordsieck (1979), Thake (1985), Holyoak (1986), Beckmann (1987) and Beckmann & Gitterberger (1987). The problem of the exact status of the various taxa which have been assigned to this genus and their relationship with each other has not been settled yet and is under active study, using modern methods, by Giusti and his coworkers. The nomenclatural scheme adopted here is based partly on the preliminary

results of Giusti and his group (F. Giusti, personal communication) and the authors' own fieldwork, particularly that of M.A.T. who has also mapped the distribution of the various species (Thake, 1985).

*Lampedusa (Lampedusa) imitatrix imitatrix* Boettger

●(Malta), V, Rest (MI)

A beautiful and important endemic occurring in a small area in western Malta (see map in Thake, 1985), where a large fraction of its former range is now covered with soil as part of a land reclamation project.

*Lampedusa (Lampedusa) imitatrix melitensis* (Caruana Gatto)

●(Malta), E, Rest (MI)

Possibly the rarest and most endangered endemic animal in the Maltese Islands. It is confined to a small number of large boulders on the cliffs at Rdum Dikkiena (Dingli Cliffs). The total population cannot be more than a few hundred individuals occupying a very precarious habitat with an area of a few tens of square metres only.

*Lampedusa (Lampedusa) imitatrix gattoi* Soós

●(Filfla Is.), E, Rest (MI)

A rare endemic confined to the island of Filfla. Recent visits to the islet failed to reveal living specimens. However, the species may still survive on the plateau which was not searched.

*Lampedusa (Muticaria) macrostoma macrostoma* (Cantraine)

Rest (MED)

This species is endemic to the Maltese Islands and Sicily. There is some evidence however that the Maltese populations are somewhat different from the Sicilian ones and which may warrant their recognition as a distinct endemic species or subspecies (Beckmann & Gittenberger, 1987). Whatever its status, *L. macrostoma macrostoma* is the commonest and most widespread member of its genus in the Maltese Islands.

*Lampedusa (Muticaria) macrostoma oscitans* (Charpentier)

●

While less widespread than the previous species, this form is nonetheless common. However, several distinct phenotypes exist, some of which present characters intermediate between those of pure *oscitans* and those of the other subspecies of the *macrostoma* group. Some of these 'intermediate' populations inhabit small areas and may be endangered due to destruction of habitat. Important populations occur at Ġordān, Xaghra and Mgarr ix-Xini in Gozo, and at Targa Gap, Bingenma Gap, Ġebel Għawżara (Wardija), Wied Dalam, Wied Has-Sabtan, Wied Żnuber and Wied Babu in Malta.

*Lampedusa (Muticaria) macrostoma scalaris* (Pfeiffer)

●(Malta), E, Rest (MI)

This beautiful form is restricted to the karstland of the Ras il-Mignuna area on the north coast of Mistra Bay where it occupies an area of a few hundred square metres only.

This unusually shaped form is restricted to a tongue of Lower Coralline Limestone extending into Xlendi Valley and known as il-Fekruna. Active building development taking place in the area has already eliminated this species from a considerable area of its former range. Several populations high in *mamotica* character occur also in Malta, the most important of which is found on the karstland at Ta' Mattew, on the west coast of Salina Bay, another locality threatened by building development.

**Family: Testacellidae**

*Testacella* sp.

RR, Rest (MI)?

[Shelled Slug; Maltese: Bugharwien tal-Qoxra]

The testacellids are carnivorous slugs with a small external shell at the hind end. These animals are subterranean, making them very hard to find. They are only known from the Maltese Islands on the basis of a single individual from San Blas in Gozo (P.J.S., unpublished record), although because they are amongst the most rarely encountered of all terrestrial molluscs, they may be more common and widespread than is at present indicated.

**Family: Hygromiidae**

Genus *Trochoidea*

[Top Snails; Maltese: Żugragal]

The systematic picture for the Maltese *Trochoidea* snails is even more confused than that for the genus *Lampedusa*! The most recent enumeration (that of Beckmann, 1987) lists eight species for the Maltese Islands, of which seven are considered endemic. Recent studies by Giusti and his group have shown that the differences in shell morphology on which most of these 'species' are based are in reality peculiar to small local populations or to groups of individuals forming part of larger populations in which shell morphology is very variable. Intermediate forms between most of the classical 'species' can be readily found. The problem of the systematics of the local *Trochoidea* is currently being investigated by the use of modern genetic techniques by Giusti's group. The list of species which follows is based on the preliminary results obtained so far.

*Trochoidea (Trochoidea) spratti spratti* (Pfeiffer)

●

The most widespread species of this group in the Maltese Islands. Highly variable in shell form which has led to the description of numerous 'species' in the past, including *schembrii*, *calcarata*, *gaulitana* and *ogygiaca*, some of which were considered endemic to the island or area where they occurred. Although no longer to be considered as distinct species or subspecies, some subpopulations of *T. spratti spratti* are distinctive and of great scientific interest; some of these occupy areas covering a few tens of metres only and are endangered due to destruction of habitat.



*Trochoidea (Trochoidea) spratti cucullus* (Martens)

● (Malta only?), E, Rest (MI)

The best population of this rare endemic is to be found at the mouth of Wied Mġra Ferha in the Mtaħleb area where the population is seriously threatened by a car-park which now covers half the area formerly inhabited by this form. Other small populations of *spratti* with strong *cucullus* characters occur in Gozo at Il-Motba tal-Qasam, Tal-Bardan and the southern tip of Xlendi Bay.

*Trochoidea (Trochoidea) spratti despotti* (Soós)

● (Filfla Is.), V, Rest (MI)

The *Trochoidea* of the islet of Filfla present some consistent differences from the populations of Malta and because of this and their reproductive isolation, the name *despotti* given to them by Soós (1933) is retained. Some Maltese *spratti* may also show some *despotti* character (see Beckmann, 1987). Recent visits to Filfla revealed a number of living snails as well as recently dead shells suggesting that the population on the islet is still thriving.

*Trochoidea (Xeroclausia) għarlapsi* Beckmann

●, V, Rest (MI)

A very recently described species (Beckmann, 1987) from the Għar Lapsi area (type locality) where it occurs in low numbers on the cliffside garigue between Għar Lapsi and Ras Manġir. This species shows strong affinities with certain North African species (F. Giusti, personal communication) and is of great biogeographical interest.

*Ceriuella caruanae* (Kobelt)

● (?)

[Caruana's Snail; Maltese: Bebbuxu tat-Torok]

A common and widespread species.

*Cochlicella conoidea* (Draparnaud)

R, Rest (MI)

[Dune Snail; Maltese: Bebbuxu tar-Ramej]

This species associates with sand-dunes, a habitat type which is rare in the Maltese Islands and consequently this snail is also rare. The largest populations occur at Għadira (Malta) and Ramla (Gozo).

Family: *Helicidae*

*Marmorana (Murella) melleensis* (Férussac)

●

[Wall Snail; Maltese: Bebbuxa tal-Bejt/Bebbuxa tal-Kalli]

A relatively common and widespread species.

Class: *BIVALVIA*  
Subclass: *Lamellibranchia*  
Order: *Anisomyaria*  
Family: *Pinnidae*

*Pinna nobilis* Linnaeus

R

[Noble Fan-shell; Maltese: Nakkra tal-Mariraj]

The largest bivalve (and shelled mollusc) in the Maltese Islands and the Mediterranean. It is a common species all over the Mediterranean but in some localities, the Maltese Islands included, inshore populations are declining due to overcollecting as the large shells are sold as curios or souvenirs (Schembri, 1986).

**Family:** Spondyliidae

*Spondylus gaederopus* Linnaeus  
[Thorny Oyster; Maltese: Gajdra]

R

Once common enough to be used as an article of food, inshore populations of this species are declining, probably through natural causes.

**Order:** Heterodonta

**Family:** Pisidiidae

*Pisidium casertanum* (Poli)  
[Caserta Pea-mussel; Maltese: Arzella ta' i-Ilma Melul]

E, Rest (MI)

The only species of freshwater bivalve to occur in the Maltese Islands. It was long thought to be extinct until a relatively large population was discovered recently at Xlendi Valley, Gozo (Sammut & Mifsud, 1988). This species is one of the most endangered of Maltese animals since it requires a very specific type of habitat (perennially flowing water and a sandy substratum overlain by a veneer of silt) which is only found in one or two localities in the Maltese Islands. The population at Xlendi Valley covers an area of a few square metres only.

## REFERENCES

- Beckmann K.H. (1987) - Land- und Süßwassermollusken der Maltesischen Inseln. - *Helvia*, 1: 1-38.
- Beckmann K.H. & Gittenberger E. (1987) - The Clausiliidae (Gastropoda) of the Maltese Islands, some additional data. - *Journal of Conchology*, 32: 335-338.
- Dell'Angelo B. & Cuppini S. (1983) - Prima segnalazione di *Acanthochitona oblonga* Leloup, 1981 lungo le coste italiane. - *Bollettino Malacologico*, 19(1/4): 11-18.
- Holyoak D.T. (1986) - Biological species-limits and systematics of the Clausiliidae (Gastropoda) of the Maltese Islands. - *Journal of Conchology*, 32: 211-220.
- Lanfranco G. (1977) - The cowries and allied shells of the Maltese Islands. - *The Maltese Naturalist*, suppl. 1, 4pp.
- Leloup E. (1981) - *Acanthochitona oblongus* sp. nov. - *Bull. Inst. R. Sci. Nat. Belg.*, Biologie, 53(5): 1-3 + Plate 1.

- Nordsieck H. (1979) - Zur Anatomie und Systematik der Clausilien, XXI. Das System der Clausilien, II: Die rezenten europäischen Clausilien. - *Arch.Molluskenk.*, 109: 249-275.
- Piani P. (1980) - Catalogo dei molluschi conchiferi viventi nel Mediterraneo. - *Bollettino Malacologico*, 16(5/6): 113-224, 1 suppl.1 (1981), suppl.2 (1981), suppl.3 (1983).
- Ruggiero L. (1983) - Ulteriori segnalazioni di *Acanthochitona oblonga* Leloup, 1981 lungo le coste pugliesi. - *Bollettino Malacologico*, 19(9/12): 263.
- Sammut P.M.; Cachia G. & Mifsud C. (in press) - *Alexis kobelti* Caruana-Gatto, 1890 - a junior synonym of *Auriculinea bidentata* (Montagu, 1808). - *Bollettino Malacologico*
- Sammut P.M. & Mifsud C. (1988) - Rediscovery of *Pisidium casertanum* (Poli, 1791). - *Potamon*, 16: 155-157.
- Schembri P.J. (1985) - The Maltese top-shell. - *Civilization*, 19: 518-519.
- Schembri P.J. (1986) - The noble fan-shell. - *Civilization*, 28: 783-784.
- Soós L. (1933) - A systematic and zoogeographical contribution to the mollusc fauna of the Maltese Islands and Lampedusa. - *Arch.Naturg.*, 2: 305-353.
- Thake M.A. (1985) - The biogeography of the Maltese Islands, illustrated by the Clausiliidae. - *Journal of Biogeography*, 12: 269-287.
- Thake M.A. & Schembri P.J. (1978) - A preliminary survey of Maltese Polyplacophora. - *Animalia*, 5(1/3): 39-49.
- Van Regteren Altena C.O. (1962) - A propos des limaces de l'île de Malte. - *Basteria*, 26: 47-57.
- Zilch A. (1977) - Die Typen und Typolde des Natur-Museums Senckenberg, 58: Mollusca: Clausiliidae (5): Aloiini (2). - *Arch.Molluskenk.*, 108: 109-161.

# INSECTS EXCLUDING COLEOPTERA AND LEPIDOPTERA

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## INTRODUCTION

Apart from the larger and more common species, the insect fauna of the Maltese Islands is still incompletely known. The following list summarizes our current knowledge of the endangered and rarer species and of the endemic forms, excluding the Coleoptera and Lepidoptera which are treated elsewhere in this compilation (see contributions by Cilia, and by Sammut & Valletta). The status of many local species is still not adequately known and exclusion of a taxon from this list does not necessarily mean that it is not threatened but may simply reflect our lack of knowledge.

## SPECIES LIST

Order: THYSANURA (Silverfish)

*Charimachilis relicta melitensis* (Stach)

A local form of silverfish (Mendes, 1980) and so far known only from the Maltese Islands.

Order: ODONATA (Dragonflies and Damselflies)

*Ischnura genei* (Rambur) V, Rest (MED)  
[= *Ischnura elegans genei* Ramb.]  
[Damselfly; Maltese: Damigellal]

A damselfly locally restricted to areas with freshwater. The species is known from the Mediterranean islands of Malta, Gozo, Comino, Sicily, Corsica, Sardinia and Capri.

*Orthetrum brunneum* (Fonscolombe) R, Rest (MI)  
[Dragonfly; Maltese: Mazzarell]

A dragonfly with a very restricted local distribution. Two specimens were recorded one each from Salina in Malta and Xlendi in Gozo by Valletta (1949), but the species appears to have become further restricted; all recent records are from Bahrija (personal observations).

Order: DICTYOPTERA (Cockroaches and Mantids)

*Ectophas kraussianus* Ramme RR, Rest (MED+MI)  
[Cockroach; Maltese: Wirdiena tal-Buskett]



In the Maltese Islands this small cockroach is restricted to Buskett (Schembri, 1980a), elsewhere it occurs only in Sicily and is therefore of biogeographical interest.

*Rivetina baetica* Rambur R, Rest (MED)  
[Praying Mantis; Maltese: Debba tax-Xitan/Debba ta' l-Infern]

In the Maltese Islands although rare, this mantid is relatively widely distributed. In the Mediterranean it occurs also in Sicily and it is known also from Northwest Africa.

Order: ORTHOPTERA (Grasshoppers and Crickets)

*Acheta palmetorum* Krauss. R, Rest (MED+MI)  
[Field Cricket; Maltese: Grillu]

A North African species of cricket which is locally rare and has a restricted distribution. Apart from North Africa, it occurs only in Malta where it is limited to humid situations. Valletta (1954) records the species from Mriehel, limits of Birkirkara, while Cilla (1975) lists it from Chadwick Lakes.

*Mogoplistes squamiger* (Fisch.) RR, Rest (MI)

A very rare cricket limited to coastal areas. It has been recorded from Xemxija (Schembri & Ebejer, 1984) and is known also from Filfla (personal observations).

*Myrmecophilus baronii* (Baccetti) ●(Malta), RR, Rest (MI)

An endemic flightless cricket which associates with ants. To date it has been found only at St. Thomas Bay, the type locality (Baccetti, 1966) and at Buskett (Schembri, 1984).

*Brachytripes megacephalus* (Lefevre) V, Rest (MI)

A large cricket which is apparently restricted to Ghadira in Malta and recorded once only from Ramla in Gozo, (Lanfranco, 1957; Cassar, 1979).

*Heteracris adspersa massai* Galvagni X(?)

A grasshopper recorded once only from Salina where the small population observed is now apparently extinct (Schembri & Ebejer, 1984)

*Odontura stenoxipha* Fieber V(?), Rest (MI)

*Conocephalus conocephalus* (L.) RR, Rest (MI)

*Homorocoryphus nitidulus* (Scopoli) RR, Rest (MI)

All three are longhorn grasshoppers. *O. stenoxipha* is apparently restricted to Ghadira and the other two species are associated with freshwater and have been found only at Fiddien and Bahrija (Schembri & Ebejer, 1983).

Order: DERMAPTERA (Earwigs)

*Anisolabis maritima* (Géné)

V, Rest (M)

A species of earwig associating with brackish water and so far recorded only from Salina (Schembri & Schembri, 1979).

Order: HEMIPTERA (Bugs)

*Psallus varius cornutus* Wagner

●, I

An endemic species of mirid bug to date known only from the original two specimens studied by Wagner (1943).

*Rhyparochromus (Liolobus) walkeri* Saund

Rest (Med)

A lygaeid bug known only from Malta, southern Yugoslavia and Cyprus (Tamanini, 1966).

*Oxycarenus lavaterae* (Fabr.)

I, Rest (Med)

*Hovathiolus gibbicollis* (Costa)

I, Rest (Med)

These two species of lygaeid bugs have a distribution restricted to the western Mediterranean, the Maltese Islands being their eastern boundary (Tamanini, 1966).

*Sciocoris ribauti* Wagner

I, Rest (Med)

A pentatomid bug with a restricted distribution in the Mediterranean. It is not found in Sicily but is present in southern Italy (Tamanini, 1966).

*Bagrada hilaris* (Burn)

R(?), Rest (Med)

A pentatomid bug of local biogeographical interest since it is known only from North Africa apart from the Maltese Islands.

Order: HOMOPTERA (Scale Insects and Aphids)

*Lacombia urbanii* Boratynski

● (Comino only?), I

Described from material collected from the nest of the ant *Tapinoma erraticum* (Latr.) on Comino Island, 21.4.1965 (Boratynski, 1969).

*Protrama (Tactiolorama ?) baronii* Hille Ris Lambers

● (Malta only?), I

An aphid described from material from the nest of the ant *Camponotus barbaricus* at Mellieha Bay 20.4.65, where it was found on the roots of *Carduus* sp. (Hille Ris Lambers, 1969).

Order: TRICHOPTERA (Caddis-flies)

*Tinodes maclachlani* Kimmins

RR, Rest (MI)

*Mesophyfax aspersus* Rambur

R

Caddis-flies require freshwater in which to pass their larval stages and because of the dearth of such habitats in the Maltese Islands, these insects are very rare here. *T. maclachlani* is known only from Buskett (Schembri, 1981) while *M. aspersus* is more widespread (Schembri & Johnson, 1987).

Order: HYMENOPTERA (Wasps, Ants and Bees)

*Mutilla maroccana* Olivier

R, Rest (MI)

A locally rare mutillid wasp known only from Bahrija, Bajda Ridge and Chadwick Lakes (Schembri, 1983). Outside the Maltese Islands the species is known from the Iberian Peninsula, Southern France, Italy, Syria, Egypt, Libya, Tunisia, Algeria, Morocco and the Spanish Sahara, but is also infrequent. The Italian records come from Calabria and Messina (Invrea, 1964).

(\*) *Smicromyrme* n.sp.

●(?), V, Rest (MI)

A single specimen of this still undescribed and possibly new mutillid wasp has been taken from Ghadira (Schembri, 1983).

*Hedychridium dismorphum* Linsenmeier

RR, Rest (MI)

A rare chrysidid wasp known only from a few individuals from St. Thomas Bay in Malta and Santa Marija Bay in Comino. This is a North African species, which, apart from the Maltese Islands, is so far known only from Biskra in Algeria (Strumia, 1981).

*Vespa orientalis* L.

E, Rest (MI)

Previously common throughout the Maltese Islands, this large social wasp is now only found in a few localities in Gozo. The reason for this decline is not known but is possibly due to natural causes coupled with human persecution (Schembri, 1980b).

*Cryphononyx bretonii* Guer.

V, Rest (MI)

This large and spectacular pompilid wasp is apparently restricted to Ghadira.

(\*) *Tachyagetes* n.sp.

●(Malta?), R

A small species of pompilid wasp possibly new to science and known only from Ghadira.

*Prionyx viduatus* (Christ)

V, Rest (MI)

*Philanthus raptor sicalus* Giordani Soika

V, Rest (MI)

*Dienoplus* sp. V, Rest (MI)

*Bembecinus tridens tridens* (Fabricius) V, Rest (MI)

All four are sphecid wasps which occur exclusively in coastal areas with a system of sand dunes. Because this habitat is under threat of obliteration locally, all four species are likely to become extinct in the near future (Schembri, in press).

*Strongylognathus insularis* Baroni Urbani  
● (Malta, Comino), RR, Rest (MI)

This endemic ant is a social parasite of other ants and until recently was known from a single nest on Comino (Baroni Urbani, 1968). Another colony has now been found at Wied il-Ghasel, Malta (Schembri & Collingwood, 1981).

*Bombus terrestris* L. V

The only Bumble Bee to occur in the Maltese islands. Although previously frequent, occurring even in gardens (Valletta, 1971), it has now become much less common. Published records are from Birkirkara and Buskett (Schembri, 1982) but the species has a wider distribution. The reason for the decline in abundance is not known but is probably due to habitat destruction coupled with the ease with which the underground colonies of this social insect are destroyed.

Order: DIPTERA (True flies)

*Ogcodes schembrii* Chvala ●

An endemic fly (Chvala, 1980) which apparently parasitizes spiders. The type locality is Fort St. Lucian (Marsaxlokk) and it has also been collected from Fiddien, Wied Qirda, Wied Qannotta and Chadwick Lakes (Chvala), 1980) and recently from Xlendi, Gozo (Schembri, 1982a).

#### REFERENCES:

- Baccetti B. (1966) - Notulae orthopterologicae XXII. II genere *Myrmecophilus* Berth. in Italia - *Redia*, 50: 1-33.
- Baroni Urbani C. (1968) - Studi sulla mirmecofauna d'Italia IV. La fauna mirmecologica delle isole Maltesi ed il suo significato ecologico e biogeografico - *Annali del Museo Civico di Storia Naturale di Genova*, 77: 408-559.
- Boratynski K. (1969) - A new species of *Lacombia* Goux, 1940, (Pseudococcidae, Homoptera) from ants' nests in the Maltese Islands - *Bollettino delle Sedute dell'Accademia Gioenia di Scienze Naturali in Catania* ser 4, 9(6): 401-409.
- Cassar L.F. (1979) - Occurrence of *Brachytripes megacephalus* Lefevre in the Maltese Islands (Orthoptera, Grylloidea) - *Central Mediterranean Naturalist*, 1(1): 22-23.



- Chvala M. (1980) - Two new European *Ogcodes* species (Diptera, Acroceridae) - *Acta Entomologica Bohemoslovaca*, 77: 131-137.
- Cilia J. (1975) - The crickets of the Maltese Islands (Orthoptera - Grylloidea) with observations on *Gryllus bimaculatus* De Geer - *The Maltese Naturalist*, 2(1): 13-24.
- Hille Ris Lambers D. (1969) - A new species of *Tactilotrampa* Börner, 1950 ? (Aphididae, Homoptera) - *Bollettino delle Sedute dell'Accademia Gioenia di Scienze Naturali in Catania ser. 4*, 9(10): 657-661.
- Invrea F. (1964) - Mutillidae - Myrmosidae, (Fauna D'Italia) Bologna: Edizioni Calderini, 302 pp.
- Lanfranco G. (1957) - Notes on the Orthoptera of Malta - *The Entomologist*, 90: 75-76.
- Mendes L.F. (1980) - New data on the Thysanurons from Malta - *Bollettino della Società Entomologica Italiana*, 112: 94-98.
- Schembri S.P. (1980a) - An addition to the list of Maltese Blattidae - *The Bulletin of the Amateur Entomologists' Society*, 39(326): 38-39.
- Schembri S.P. (1980b) - Vespoidea from the Maltese Islands (Hymenoptera Aculeata) - *Bollettino della Società Entomologica Italiana*, 112(46): 90-93.
- Schembri S.P. (1981) - First record of the order Trichoptera from the Maltese Islands - *The Bulletin of the Amateur Entomologists' Society*, 40(330): 25-26.
- Schembri S. (1982a) - Range extension of *Ogcodes schembrii* (Diptera: Acroceridae) - *Potamon*, 1(10): 134.
- Schembri S. (1982b) - Recent records of Hymenoptera - Apoidea from the Maltese Islands - *Bulletin of the Amateur Entomologists' Society*, 41(334): 36-41.
- Schembri S.P. (1983) - The Mutillidae of the Maltese Islands; remarks and additions (Hymenoptera Aculeata) - *Bollettino della Società Entomologica Italiana*, 115 (13): 25-30.
- Schembri S.P. (1984) - Notes on the Orthoptera of the Maltese Islands. The genus *Myrmecophilus* (Orthoptera: Gryllidae) - *The Central Mediterranean Naturalist*, 1(3): 57-79.
- Schembri S.P. (in press) - Sphecid wasps of the Maltese Islands: a review (Hymenoptera: Sphecidae) - *The Central Mediterranean Naturalist*.
- Schembri S.P. & Collingwood C.A. (1981) - A revision of the myrmecofauna of the Maltese Islands (Hymenoptera Formicidae) - *Annali del Museo Civico di Storia Naturale di Genova*, 83: 417-442.
- Schembri S.P. & Ebejer M.J. (1983) - A review of the Tettigoniidae of the Maltese Islands - *Bollettino della Società Entomologica Italiana*, 115 (8/10): 135-138.

- Schembri S.P. & Ebejer M.J. (1984) - Recent additions to the Orthoptera of the Maltese Islands - *Bollettino della Società Entomologica Italiana*, 116(47): 81-82.
- Schembri S. & Johnson D. (1987) - The order Trichoptera in the Maltese Islands - *The Bulletin of the Amateur Entomologists' Society*, 46: 50-51.
- Schembri S.P. & Schembri J.L. (1979) - A preliminary report on the Dermaptera of the Maltese Islands - *Annali del Museo Civico di Storia Naturale di Genova*, 82: 329-332.
- Strumia F. (1981) - Imenotteri Crisididi delle isole Maltesi (Hym. Chrysidiidae) - *Bollettino della Società Entomologica Italiana*, 113(8-10): 167-168.
- Tamanini L. (1956) - Eterotteri delle isole Maltesi (Hemiptera, Heteroptera). - *Bollettino delle Sedute dell'Accademia Gioenia di Scienze Naturali in Catania*, ser. 4, 8(9): 679-697.
- Valletta A. (1949) - Preliminary list of the Odonata of the Maltese Islands - *The Entomologist*, 82: 85-87.
- Valletta A. (1954) - A list of the Orthoptera of the Maltese Islands. *The Entomologist*, 87: 11-15.
- Valletta A. (1971) - A preliminary list of the Hymenoptera Aculeata (excluding ants) of the Maltese Islands - *Entomologists' Monthly Magazine*, 114: 215.
- Wagner E. (1943) - Zwei neue mediterrane Psyllus-Arten aus dem Senckenberg-Museum (Hemiptera-Heteroptera) - *Senckenbergiana*, 26: 68-71.



(a) *Coprionotus hispanus*, a horned dung beetle, which locally occurs in small numbers. (Photo: J. L. Cilia).



(b) Populations of the Loggerhead Turtle, *Caretta caretta*, are declining all over the Mediterranean. (Photo: N. Fenech).



# LEPIDOPTERA

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## INTRODUCTION

Malta's change in role from island fortress to tourist centre and the subsequent diversification of the economy have brought about an inevitable change in the countryside, which, in such a small island makes a very noticeable impression upon its flora and fauna. Large areas of cultivated and uncultivated land have been taken over for the construction of hotels, villas and blocks of flats, for the extension of the airport and for new roads and the widening of old ones. Furthermore, the construction of docks and the expansion of industrial estates, as well as the opening of new quarrying sites to provide the necessary building material for these projects, have all taken their toll of hitherto unspoiled areas of countryside. Moreover, with the improvement in the standard of living and the subsequent demand for more spacious accommodation, new residential areas have sprung up and housing estates now surround many of the old towns and villages. All this has considerably reduced the habitat and food supply of many of our resident species of Lepidoptera. Similarly, many of the occasional migratory species fail to establish themselves permanently for lack of suitable foodplants and adequate habitat. As if all this is not enough the cleaning of the valleys, known as the 'Risq il-Widien' project has helped in no little way in destroying both the habitat and foodplants of many species of insects. Factors beyond human control, such as climate, also play their part in determining the availability of essential foodplants. Consecutive winters with a low rainfall seriously limit the growth of annuals on which many species of lepidopterous insects feed.

Resident populations of many of the 600 odd species of Lepidoptera recorded for Malta are strengthened by annual migrations either from South Italy or North Africa. It is high time that a co-ordinated mapping programme be undertaken to assess accurately and fully the status of our resident Lepidoptera and especially the endemic species existing on our islands. Only then would we know which species are endangered and some breeding and releasing programme, or the planting of particular foodplants, be carried out to improve or stabilise populations of species heading towards extinction.

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It is with deep regret that we record the passing away of Mr. Anthony Valletta F.R.E.S. on 08.12.88. (Eds)



## SPECIES LIST

### HETEROCERA (Moths; Maltese: Bahrijiet)

#### PSYCHIDAE (Taleporiinae)

*Sciopetris melitensis* Rebel

●, X(?)

Described from a single male taken in 1916 by A. Andres (Andres, 1916), a prisoner of war. Redescribed again by G. Amsel from another male taken from Gharghur in 1953. Not recorded since and may be already extinct.

#### TINEIDAE (Nemapogoninae)

*Antitinea deluccae* Amsel

●(Gozo?), X(?)

Taken only once from Xlendi in 1953 and not recorded since. The female and early stages are undescribed and the foodplant is unknown. The type locality has now been developed into a tourist complex.

#### PTEROLONCHIDAE

*Pterolonche vallettae* Amsel

●(Malta?), RR(?)

Recorded from Mistra and Lippija in 1953 by A. Valletta and not taken since although it may still occur at Lippija (Valletta, 1973).

#### SYMOCIDAE

*Decogonia dellucci* Amsel

●, RR(?)

The type locality (Salina Bay) has been developed into a tourist complex. This species has however been recently collected from Imtahieb by the authors (Sammut, 1984).

*Symoca melitensis* Amsel

●(Malta?), X(?)

Taken for the first time in 1949 and last recorded in 1955 (Amsel, 1952). The early stages and the foodplant are unknown. The type locality, Salina Bay, has been built over.

#### GELECHIIDAE (Gelechiinae)

*Epidola melitensis* Amsel

●, X(?)

Recorded in 1953 from Ġnejna and Wied il-Lunzjata in Gozo (Valletta, 1973) and not recorded since although it may still occur at Wied il-Lunzjata.

*Megacraspedus lativalvellus* Amsel

●(Malta?), X(?)

Recorded only by C. De Lucca in 1952. The type locality was where Kennedy Grove is now. The foodplant and early stages are undescribed.

# TORTRICIDAE (Tortricinae)

*Aphelia amplana* Hübner f. *vallettae* Bradley ●

Widely distributed and very well established although it is fast disappearing from three of its strongholds: Wied Incita, now converted into a quarry; Wied il-Ghasel near the Mosta bridge; and Għar Lapsi in the area where the reverse osmosis plant has been constructed.

## (Olethreutinae)

*Cydia (Kenneliola) sammuti* Diakonoff ●, I

A recently described species (Diakonoff, 1986) known only from a single male taken from Buskett in June 1981.

# PYRALIDAE (Phycitinae)

*Phycitodes saxicola vallettae* (Amsel) ●, RR

Originally described as *Homoeosoma vallettae* by Amsel (1951). The type locality (Mistra) has been developed into a tourist complex. This species has recently been recorded in small numbers, together with the nominal form, from Imtahlab by the authors.

# PTEROPHORIDAE (Agdistinae)

*Agdistis symmetrica* Amsel ● (Malta?), I

Known only from the male holotype taken from Bahar id-Ġagħaq on 20.08.53 by A. Valletta. The status is unknown as this species is easily mistaken for the commoner *Agdistis* spp. The foodplant and female are unknown, and the life cycle has not yet been worked out (Sammut, 1984).

*Agdistis melitensis* Amsel ● (Malta?), RR

Recorded from Salina Bay in 1952 and 1953 and recently (1982) recorded from Rabat. The type locality has been developed into a tourist complex. The life cycle and foodplant are unknown.

# GEOMETRIDAE (Boarmiinae)

*Apochima flabellaria* Heeger V, Rest (MED)

This species has become rather scarce; the foodplant is *Foeniculum vulgare* Miller (Fennel; Maltese: Busbies).

# SPHINGIDAE (Macroglossinae)

*Hyles euphorbiae* Linnaeus

E, Rest (MED)

(Spurge Hawkmoth; Maltese: Bħrija tat-Tengħud)

Clearing of its foodplant, *Euphorbia* spp., from roadsides might be endangering this species.

#### ARCTIIDAE (Arctiinae)

*Uthetheisa pulchella* Linnaeus X(?)  
[Crimson Speckled; Maltese: Bahrija tal-Ghobbejral]

A species with a wide European distribution which used to be common locally, but which is now probably extinct. However, recently it has been observed once, at light at the Paradise Bay Hotel, Cirkewwa in October 1987 (Valletta, 1988).

#### NOCTUIDAE (Hadeninae)

*Brithys encausta* Hübner V, Rest (MED+MI)  
[Pancratium Moth]

This species is restricted to a single locality in Malta (Rdum il-Hmar) and another single locality in Gozo (Remla l-Hamra). The foodplant is *Pancratium maritimum* [Sea Pancratium; Maltese: Pankrazjul].

*Mythimna putrescens vallettai* Boursin ● (Malta?), R  
[Wainscot]

A rare but widely distributed species; not threatened.

#### (Cucullinae)

*Blepharita vallettai* De Laever ●  
[Valletta's Brocade]

A very well established, widely distributed and polyphagous species; not threatened.

*Polymixis canescens* Hübner V, Rest (MED+MI)

The stronghold of this species used to be the *Urginea maritima* stands at Wied il-Ghasel near the Mosta bridge, which have now been built over; however, it occurs in small colonies elsewhere.

#### (Catocalinae)

*Catocala elocata* Esper V, Rest (MED+MI)  
[Red Underwing; Maltese: Bahrija tal-Luq]

*Catocala conjuncta* Esper V, Rest (MED+MI)  
[Red Underwing; Maltese: Bahrija tal-Luq]

*Catocala nymphagoga* Esper V, Rest (MED+MI)  
[Oak Yellow Underwing; Maltese: Bahrija tal-Luq]

*Ephesia nymphaea* Esper, 1788 V, Rest (MED+MI)  
[Oak Yellow Underwing; Maltese: Bahrija tal-Luq]

These four species of Underwings are restricted almost exclusively to Wied il-Luq at Buskett. Other very small colonies might exist where White Poplar grows.

*Grammodes bifasciata* Petagna RR, Rest (MED+MI)  
[Geometrician]

Restricted to a single locality in Malta (Wied tal-Bahrija) where it is already very rare.

*Phragmatobia fuliginosa melitensis* O. Bang-Hass ●  
[Ruby Tiger]

Very common and widely distributed in all the Maltese Islands; not threatened.

## HETEROCERA [Butterflies; Maltese: Friefet]

### PAPILIONIDAE: (Papilioninae)

*Papilio machaon melitensis* Eller ●(?)  
[Swallowtail; Maltese: Farfett tal-Fejġel]

This subspecies is generally considered conspecific with the ssp. *sphyrus* Hubner, which is widely distributed and is found all over the south of Europe, Sicily, the Maltese Islands and N. Africa. The habit of clearing country roads of its main foodplant, *Foeniculum vulgare* [Fennel; Maltese: Busbies] may endanger this beautiful species.

### PIERIDAE (Golladinae)

*Gonepteryx cleopatra* Linnaeus ab. *vallettai* Haworth  
[Mediterranean Brimstone; Maltese: Farfett taż-Żiġu]

Only two examples of this aberration have been recorded up to now. This aberration is considered to be of genetic origin and so its appearance, survival and conservation depend on the *G. cleopatra* populations at Buskett which for the time being seem to be stable.

### SATYRIDAE

(\*) *Hipparchia aristaeus algerica* Oberthur  
*f. vallettai* DeLattin ● (Malta?), X(?)  
[Southern Grayling]

Taken only once at Naxxar by A. Valletta in 1939. Not recorded since.

*Maniola furtina hyperhispuila* Thomson ●  
[Meadow Brown; Maltese: Farfett Kannella]

Very common and widely distributed in all of the islands of the Maltese Archipelago.



*Coenonympha pamphilus* Linnaeus  
[Small Heath]

V

The early spring brood is on the decline while the summer brood, known as the *f. lyllus* Esper, is vulnerable since it is dependent on the Wild Thyme which is fast disappearing due to land development and reclamation. This species of butterfly has a wide European distribution.

#### DANAIDAE

*Danaus chrysippus* Linnaeus  
[Golden Danaid]

RR

A very rare migrant butterfly on our islands. During the last 10 years it has been recorded annually, always in small or very small numbers. One of us (A.V.) has succeeded in breeding this butterfly from a gravid female taken in the wild. The appearance of this species on the island generally coincides with migrations of the common nymphalid *Vanessa cardui*, the Painted Lady, although one cannot exclude that *Danaus chrysippus* is breeding in small numbers on the island. The success in establishing itself here depends on the presence of the food plants of the genus *Asclepias*, which do not occur in the wild in the Maltese Islands.

#### LYCAENIDAE (Polyommatainae)

*Lycaena phlaeas* Linnaeus  
[Small Copper; Maltese: Farfett ta' l-Angiul]

V

The summer brood, known as *f. eleus* Fabricius, is also vulnerable for the same reasons as for *C. pamphilus*. *L. phlaeas* has a wide Palaearctic distribution.

*Aricia agestis* Denis & Schiffermüller V, Rest (MED)  
[Brown Argus; Maltese: Farfett ta' l-Angiul]

Vulnerable for the same reasons as for *C. pamphilus*. *A. agestis* has a wide Mediterranean distribution.

#### HESPERIIDAE (Hesperiinae)

*Gegenes pumilio* Hoffmannsegg V, Rest (MED)  
[Skipper]

Although this species has been with us since the late forties, it is still considered to be the rarest resident butterfly; feeds on grasses, mainly *Cynodon dactylon* (Bermuda grass; Maltese: Nigem).

#### APPENDIX

##### TINEIDAE (Nemapogoninae)

*Praeacetes deluccae* Ansel

I

This species has been placed in synonymy with *P. atomosella*, which has a Mediterranean distribution and so cannot be considered endemic. Its status in Malta is not very well known although it has been recently taken from Paola.

#### SYMMOCIDAE

*Apatema fasciata melitensis* Amsel

RR(?)

This species has been placed in synonymy with the common and widespread circummediterranean *Apatema mediopallidum*. The type locality was where there is now Kennedy Grove.

#### COLEOPHORIDAE

*Coleophora mellechella* Toll

RR, Rest (MED)

This species has been described from material collected by C. DeLucca from Mellieha. It is now considered to belong to the senior taxon *C. conyzae* Zeller of which a very short series has been collected from Rabat during 1981.

#### PTEROPHORIDAE (Pterophorinae)

*Acitipilia spicidactyla* Chretien f. *insularis* Bigot

I, Rest (MED)

Both typical *A. spicidactyla* and the f. *insularis* are considered to be synonymous with *Pterophorus malacodactylus* Zeller and as such are not endemic. A rare species in Malta about which very little is known.

#### REFERENCES

- Amsel H.G. (1951) - Eine neue maltesische *Homoeosoma*. - Mitt. Muncher Ent. Gesellschaft., 41: 248-250.
- Amsel H.G. (1952) - Two new microlepidoptera from Malta. *Entomologist*, 85: 172-174.
- Andres von A. (1916) - Verzeichnis der während meiner Kriegsgesellschaft von mir auf Malta gesammelten Lepidoptera 1916. - *Entomologische Rundschau*, 33(9):43-54, (10)48-49, (11)50.
- Diakonoff A. (1986) - Two new Grapholitini from Malta and Madeira (Lepidoptera, Tortricidae). - *Nota Lepid.*, 9(3-4): 170-174.
- Sammot P.M. (1984) - A systematic and synonymic list of the Lepidoptera of the Maltese Islands. - *Neue Ent. Nach.*, 13: 1-124.
- Valletta A. (1973) - *The moths of the Maltese Islands*. - Valletta: Progress Press, 120pp.
- Valletta A. (1980) - The butterflies of the Maltese Islands and their dwindling habitats. - *Nota Lepid.*, 2(4):165-166.
- Valletta A. (1986) - *Danaus chrysippus* L. in Malta. *Potamon*, 15: 114-115.

Valletta A. (1988) - The crimson-speckled moth - *Uthetheisa pulchella* L., (Lepidoptera: Arctiidae) in the Maltese Islands. - *Potamon*, 16: 148-149.



*Mythimna putrescens vallettai* Boursin

# COLEOPTERA

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## INTRODUCTION

Of the Maltese fauna, the group with the largest number of representatives is without doubt the order Coleoptera of the class Insecta; the beetles (Maltese: Manfus). To date over 700 species have been recorded locally from a wide range of habitats, and many others doubtlessly will be discovered with further research. A considerable number of these species are endemic. Within the limits of our present knowledge, the following list includes all recorded endemic taxa together with species with a restricted distribution locally and/or globally and species of zoogeographical or other scientific interest. Some local species are known only from a few, or even single, specimens. Since most of these species are small, and consequently easily overlooked, it is difficult to ascertain their true status. Most published works on local beetles are simply lists of scientific names with little or no information about distribution and biology. A considerable number of species have a restricted distribution as they are associated with habitat types that are rare in the Maltese Islands (e.g. saline marshland, sand dunes, freshwater etc.). Other species have not been reported for a long time; this may be partly due to their small size making them easily overlooked, as already mentioned, but may also be due to loss of habitat. It is therefore important that habitats, rather than the species themselves, be considered in conservation projects. Some of the larger and more conspicuous species suffer direct human persecution because they are large enough to attract attention and are often indiscriminately killed out of a general fear of large insects.

The nomenclature used in this list generally follows that of Cameron & Caruana Gatto (1907), with the exception of families that have recently been revised on a local basis, and of records not included in Cameron & Caruana Gatto's catalogue. The classification of families follows Crowson (1967).

## SPECIES LIST

Family: CARABIDAE (+ Cicindelidae) [Tiger and Ground Beetles]

This family is represented locally by over 50 species. Most are small and inconspicuous, but some of the larger sized species are declining in number due to habitat destruction. Those species which live under stones are under threat because of the habit of overturning stones to collect snails for food. Magistretti (1965) has revised the nomenclature of the Italian species and included also those occurring in the Maltese Islands.



*Cicindela melancholica* F.  
[Tiger Beetle]

V, Rest (MI)

Restricted to a few moist areas.

*Cicindela campestris siciliana* Luig.  
[Tiger Beetle]

X(?), Rest (MED+MI)

A subspecies endemic to Sicily and the Maltese Islands. Since the original record of this species by Cameron & Caruana Gatto (1907), there has been only one other (unpublished) record by the author of a specimen from Mistrà in 1973.

Other species of the genus *Cicindela* which have been reported once only are the following:

*Cicindela littoralis* F.

X(?)

Recorded only by Cameron & Caruana Gatto (1907)

*Cicindela trisignata siciliensis* Horn

X(?)

A subspecies endemic to Sicily, the island of Malta and to Linosa. Recorded by Gridelli in 1944 (Magistretti, 1965)

*Cicindela lunulata nemoralis* Ol.

X(?)

Widely distributed in Europe from the Mediterranean to the Atlantic. Reported from the island of Malta by Mandl in 1934 (Magistretti, 1965)

*Carabus morbillosus alternans* Pallrd.  
[Maltese: Bunittien]

V, Rest (MED)

A subspecies endemic to southern Italy (Calabria), Sicily and the Maltese Islands.

*Calosoma maderae indigator* F.

RR

A West Mediterranean subspecies, recorded locally on a few occasions.

*Rheicheira italica* Holdh

Rest (MED+MI)

Reported by Schembri et al. (1987) from Mgiebaħ. The ssp. *italica* is possibly present, which is restricted to Calabria, Sicily and Malta.

*Acinopus ambiguus* Dej.

V, Rest (MED)

Endemic to Sicily and the Maltese Islands.

*Acinopus picipes* Ol.

V, Rest (MI-Comino?)

Reported by Schembri et al. (1987) from sand dunes at Santa Maria Bay, Comino.

*Epomis circumscriptus* Duft.

R, Rest (MI)

Locally restricted to watercourses.

*Chlaenius velutinus auricollis* Gene. V, Rest (MED+MI)

A subspecies found in Corsica, Sardinia, Sicily and the Maltese Islands. Locally it is restricted to moist valleys.

*Chlaenius olivieri* Crotch V, Rest (MI)

Restricted to wetland areas.

*Amblystomus cephalotes* Reitt R, Rest (MED)

Known only from Malta and Syria and of biogeographical interest as a Middle Eastern element in our fauna.

*Acupalpus elegans* Dej V(?), Rest (MI)?

Recently reported from Salina (Schembri et al., 1987).

*Acupalpus bistriga* Reitt ●, I

Endemic to the Maltese Islands.

*Acupalpus lucasi* Gaubii V, Rest (MED)

Known only from Algeria and Malta and of biogeographical interest as a North African element in our fauna.

*Acupalpus notatus discus* Reitt ● (Malta), V(?)

A subspecies endemic to the island of Malta. Recently reported from Bahrija (Schembri et al., 1987). Author's record from Chadwick Lakes (8:111:75).

*Prystonichus melitensis* Fairm ●

A widespread, endemic species.

*Scarites buparius pyracmon* Bon. V, Rest (MI)

Locally restricted to northern Malta.

*Masoreus wetterhalli* Gyllh. R, Rest (MI)

To date known only from Manoel Island (author's unpublished record 18:iv:74).

*Tachys scutellaris* Steph V, Rest (MI)

First reported by Cameron & Caruana Gatto (1907) from saltmarshes, and confirmed from Salina by Schembri (Schembri et al., 1987).

*Pogonus chalceus* Marsh V(?) Rest (MI)?

Reported as "common all the year" by Cameron & Caruana Gatto 1907, and as limited in distribution by Schembri et al., (1987).

*Harpalus ardosiacus* Lutsh

R, Rest (MI) (?)

Recently reported by Schembri et al. (1987) from Bahrija. Possibly refers to ssp. *pseudoquadricollis* Shaub which is endemic to Corsica, Sardinia and Sicily.

*Parophanus hispanus* Ramb.

R(?), Rest (MI) (?)

Recently reported from Ghajn Hadid (Schembri et al., 1987).

*Stenolophus shrinshireanus* Steph

R(?), Rest (MI)

First reported by Cameron & Caruana Gatto (1907) from Gozo. Recently recorded from Wied il-Qliegha/Fiddien. (Schembri et al., 1987).

*Anisodactylus virens* Dej.

R

Reported by Cameron & Caruana Gatto (1907) as *A. poeciloides* Steph and placed in this species by Magistretti (1975). According to Magistretti (1975, sic Jeannel 1941-42), besides specific differences the two species can be separated by their respective habitats. *A. poeciloides* is a halobiont while *A. virens* is a halophile. The same author also separates the two species by distribution. *A. poeciloides* occurs in Central and South East Europe including England, and the Balkans, while *A. virens* Dej. occurs in South West Europe and North Africa. The ssp. *winthemi* of *A. virens* was recently reported by Schembri et al. (1987).

Family: HALIPLIDAE (Small Water Beetle)

This family is represented locally by a single species which is generally found in rainwater rockpools with abundant algae on which the beetles feed.

*Halipus (Neohalipus) lineaticollis* Marsh

V

Previously, this species was much more common. Local populations have been reduced due to the draining of rockpools, a practice often associated with bird trapping.

Family: DYTISCIDAE (Carnivorous Diving Beetles;  
Maltese: Manius, Wirdien ta' l-limal)

This family is represented locally by about 10 species all of which are totally aquatic in both the larval and adult stages and therefore restricted to such habitats as freshwater springs, small ponds and temporary rainwater pools. Because these habitats are rare in the Maltese Islands all species are vulnerable. Only confirmed records are included here; the status of the other species is not known.

*Laccophilus interruptus* Pz (= *hyalinus* D.G.)

V, Rest (MI)

Cameron & Caruana Gatto (1907) give the var. *testaceus* Aubé.

*Meladema coriaceum* Lap. V, Rest (MI)

*Dytiscus (Macrodytes) circumflexus* F. V, Rest (MI)  
[Diving Beetle; Maltese: Wirdiena ta' l-ilma]

The last two species listed are diving beetles large enough to encourage irresponsible collecting by parties of children on frog-hunts. Both species occur only in localities with a considerable volume of freshwater.

**Family: HYDROPHILIDAE (Water and Land Scavenger Beetles)**

This family which is represented locally by over 20 species includes beetles associated with such habitats as water, leaf litter, and dung. These insects generally feed on decomposing vegetable matter. All species listed here are associated with freshwater habitats and hence are vulnerable.

*Berosus affinis* Brull V, Rest (MI)

*Dactylosternum insulare* Lap. ●(?), I

Reported by Cameron & Caruana Gatto (1907); possibly an endemic form.

*Helophorus (Empleurus) rufipes* (Bosc d'Antic) V, Rest (MI)

Previously reported as *Helophorus rugosus* Ol. by Cameron & Caruana Gatto (1907).

*Helophorus (Trichelophorus) alternans* Gene V, Rest (MI)

*Helophorus (Magdalenophorus) aquaticus* L. V, Rest (MI)

Other little known species of *Helophorus* associated with freshwater were reported by Cameron & Caruana Gatto (1907) as:-

*Helophorus porculus* Bedel I

*Helophorus dorsalis* Marsh v. *emanciatus* Kuw. I

*Helophorus algericus* Bach. I

*Helophorus pallidipennis* Motsh. n. *reitteri* Kuw. I

*Coelostoma orbiculare* F. V, Rest (MI - Gozo?)

Generally found in moss and the debris that accumulates at the banks of small ponds.

**Family: HYDRAENIDAE (Vegetarian Water Beetles)**

A family of very small aquatic insects which feed on water vegetation and algae. The eight species reported by Cameron & Caruana Gatto (1907)



were included in the family *Hydrophilidae*. The following species were reported as rare by the same authors.

*Ochthebius subinteger* Muls. R(?), Rest (MI)

*Ochthebius exaratus* Muls. R(?), Rest (MI)

*Ochthebius impressicollis* Lav. v. *imperfectus* Kuw.  
R(?), Rest (MI)

Although the var. *imperfectus* Kuw has been designed 'rare' by Cameron & Caruana Gatto (1907), the nominal form seems to be common.

*Hydraena nigrita* Germ. R(?), Rest (MI)

# Family: HISTERIDAE (Scavenger Beetles)

The members of this family, represented locally by about 20 recorded species, are of a shiny black or metallic colour. They live and feed on carrion, dung and vegetable refuse.

*Saprinus (Saprinus) algericus* Payk R(?)

Reported as rare by Cameron & Caruana Gatto (1907). Also noted by Luigioni (1929) and Vienna (1980), possibly on the basis of the previous record.

*Saprinus strigil* Marsh. R, Rest (MED+MI)

Recently recorded by Vienna (1983). Known only from Cyprus, the Middle East and eastern Africa.

*Hypocaccus (Baeckmanniolus) dimidatus* (Ill) R(?)

Reported as *Saprinus dimidatus* Ill. by Cameron & Caruana Gatto (1907). Recently recorded from Ramla, Gozo by Schembri *et al.* (1987) and previously by Vienna (1983).

*Onthophilus globulosus* (Olivier) R(?)

Reported from Valletta by Cameron & Caruana Gatto (1907) as *Onthophilus exaratus* Ill. Also noted by Luigioni (1929) and Vienna (1980; 1983). Recently reported from Gozo by Schembri *et al.* (1987).

*Gnathoncus buyssoni* Auzat V, (Rest (MI)

Reported only from Ghar il-Friefet Cave associated with bat guano (Vienna, 1983; Schembri *et al.*, 1987). In Europe it is known from the nests of squirrels, birds (e.g. *Corvus*, *Parus*, *Sturnus*) and on some fungi (Vienna, 1980).

*Gnathoncus schmidtii* Reitter V, Rest (MI)

Reported recently by Vienna (1983) and similarly to the previous species lives in birds' nests and on bat guano.

Family: SCYDMAENIDAE

A family of small and little known leaf litter species.

*Scydmaenus (Scydmaenus) tarsatus* Mull et. Kunze I

A species from humid areas (Cameron & Caruana Gatto, 1907; Poggi, 1980).

(\*) *Scydmaenus* n.sp. (?) ●(?), I

This supposedly new species of *Scydmaenus* was reported from Marsa by Cameron & Caruana Gatto (1907).

(\*) *Stenichnus (Cyrtoscydmus)* sp. ●(?), I

Poggi (1980) lists this unknown species from material consisting only of one female from Wied il-Ghasel and comments that it can possibly refer also to *Cyrtoscydmus* n.sp. reported by Cameron & Caruana Gatto (1907) from Fort Manoel.

Family: SILPHIDAE [Burying Beetles]

This family is locally represented by only three species, the commonest being *Silpha olivieri* Bedel. The other two listed below were recorded by Cameron & Caruana Gatto (1907) and designated as rare.

*Catops morio* F. R

*Ptomophagus sericatus* Chaud R

Family: STAPHILINIDAE (Rove Beetles; Maltese: Katerini, Kappillanli)

Beetles of this family, which locally number over 150 species, are generally small and specialised examination is necessary to determine the different species. For this reason the exact status of most species is not known. The nomenclature of Central Mediterranean Staphilinidae has recently been revised and updated by Bordonì (1973). More recently Schembri & Schembri (1982) have added 28 new records to the Maltese staphylinid fauna and have revised some of the identifications.

*Micropeplus procatus insularis* Dod. I, Rest (MED)

A subspecies restricted to Corsica, Sardinia, Sicily and the Maltese Islands.

*Trogophloeus (Taenosoma) championi* Cameron. ●, R(?)

An endemic species described by Cameron (1912).

*Trogophloeus (Taenosoma) siculus* Muls & Rey I, Rest (MED)

Restricted to Calabria, Sicily, the Maltese Islands and Corfu.

*Bledius (Euceratobledius) furcatus* (Ol.) RR, Rest (MI)

*Bledius (Bledius) unicornis* (Germ) RR, Rest (MI)

The two foregoing species of *Bledius* are associated with saline marshland and had already been reported as rare and decreasing in numbers by Caruana Gatto in 1925.

*Bledius (Bledius) tricornis* (Hbst) RR, Rest (MED+MI)

Associated with perennial freshwater springs and known only from Campania, Sicily and the Maltese Islands.

*Stenus (Tesus) brunneipes maximus* Puthz I, Rest (MED)

A subspecies first described from Malta by Puthz (1968) and now known to have a Siculo-Maghrebine distribution.

*Astenus (Astenognathus) gattoi* Cameron ●, I

First described by Cameron (1910) and apparently endemic to the Maltese Islands.

*Astenus (Astenognathus) walkerii* Fauv ●, I

Described by Fauvel in 1900 (Bordoni, 1973) as endemic to the Maltese Islands. Its taxonomic status has recently been confirmed by Colffait (1971).

(\*) *Astenus (Astenognathus) filiformis lutepennis*  
Colff. ●(?), I

\* *Astenus (Astenognathus) filiformis championi* Colff.  
●(?), I

The foregoing subspecies (or varieties) of *A. filiformis* were instituted by Colffait (1971) and based upon differences in colour pattern; these are of doubtful taxonomic value.

*Scopaeus (Anomognathus) gracilis siculus* Binaghi  
Rest (MED)

Known only from the Maltese Islands, Sicily (Palermo) and Calabria.

*Achenium (Achenium) striatum* Latr. I, Rest (MED)

(\*) *Achenium (Micrachenium) tenellum* Er. I, Rest (MED)

The foregoing two species of *Achenium* are of Maghrebine origin and are known only from N.W. Africa, Sicily, the Maltese Islands and Calabria.

*Achenium* n. sp. (?) ●(?), I

Koch (1937) and Bordoni (1973) both state that the species listed by Cameron & Caruana Gatto (1907) as *Achenium brevipenne* Quéd. is a new species probably endemic to the Maltese Islands.





(a) The Filfla race of the Maltese Wall Lizard, *Podarcis filfolensis*, is found only on this small islet. (Photo: Joe Sultana).



(b) The Algerian Hedgehog, *Erinaceus algirus*, is frequently killed by motor vehicles on country roads. (Photo: Joe Sultana).



Known only from the Maltese Islands, Sicily, Calabria and Campania.

*Tachyusa (Callusa) balteata* Er. R(?)

(= *Tachyusa cingulata* Jek : sic! Cameron & Caruana Gatto 1907). (= *Callusa (Tachyusa) cingulata* Jek : sic! Tonna Barthet, 1931)

Listed as rare by Tonna Barthet (1931) and included in the family Pselaphidae.

*Atheta* spp.

The following species of *Atheta* recorded by Schembri & Schembri (1982) are associated with bat guano from caves. This habitat is very rare in the Maltese Islands making the species also rare and vulnerable.

*Atheta (Atheta) nr. crassicornis* (F) V

*Atheta (Atheta) linderi* Bris. V

# Family: PSELAPHIDAE

This family is represented locally by eight recorded species all of which are very small. Some species associate with ants while others are found on flower heads.

*Tychomorphus integer* (Reitt). R(?), Rest (MED+MI)

First reported by Poggi (1980) and also mentioned by Schembri et al. (1987) from Wardija. Known only from Sicily, Malta and probably Tunisia.

*Euplectus brunneus* Grimm I

Reported by Cameron & Caruana Gatto (1907) and mentioned by Poggi (1980).

*Euplectus corsicus* Guillebeau R(?)

Poggi (1980) recorded this species from a specimen he examined at the Muséum d'Histoire Naturelle of Geneva, labelled "Malta". The species is known from Italy, Corsica, Sardinia, Elba, Montecristo and Sicily.

*Brachygluta dentiventris* (Saulcy) I

First reported by Cameron & Caruana Gatto (1907) as *Bryaxis cameroni* Reitt. Also reported by Poggi (1980) from Chadwick Lakes. Tonna Barthet (1931) listed the species as *Brachygluta cameroni*. *Bryaxis cameroni* was originally described as an endemic species. It is now considered synonymous with *B. dentiventris*.

Reported as common by Cameron & Caruana Gatto (1907) and confirmed as *ssp. aubei* (Tourn) by Poggi (1980) from Salina. Distributed around the SW coast of the Mediterranean and the Atlantic coasts of France. Possibly associated with saltmarshes.

*Brachygluta simplex hipponensis* (Saulcy)

RY(?)

*Brachygluta perforata* (Aubé)

R(?)

These two species of *Brachygluta* were first recorded for Malta by Baudi (1889). Poggi (1980) confirmed these records after examining Baudi's specimens at the Museum and Institute of Zoology of Turin University.

Another species of Pselaphidae: *Trissemus olivieri* (Raffr.) was reported as *Bryaxis opuntiae* Schmidt by Cameron & Caruana Gatto (1907). It is common on Barbary Figs. (*Opuntia* sp.) (Poggi, 1980).

**Family: TROGIDAE**

This family is represented locally by a single species which is a carrion feeder.

*Trox hispidus* Pont.

V(?)

Cameron & Caruana Gatto (1907) give the variety *asiaticus* Fald. as occurring in the Maltese Islands.

**Family: GEOTRUPIDAE** [Dor or Dung Beetles; Maltese: *Manfus tal-Hmieġ*]

This family is represented locally by two species which burrow under dung and bury it, hence returning nutrients to the soil and improving its fertility

*Geotrupes douei* Gory.

X(?)

**Family: SCARABAEIDAE** [Chafers and other Dung Beetles]

This family includes some large and interesting species of 'horned' dung beetles and chafers, which are potentially threatened due to indiscriminate killing and collecting. The local members of this family number some 34 species, of which 16 belong to the subfamily Aphodinae, which is in need of taxonomic revision.

*Scarabeus (Atheucus) semipunctatus* F.

RR

[Scarab Beetle; Maltese: *Manfusa tal-Hmieġ*]

Associates with sandy areas and known only from Mellieħa (Cameron & Caruana Gatto, 1907) and from a single specimen from Ramla l-Hamra, Gozo (author's unpublished record, 3:ix:75).

<i>Bubas bison</i> L.	R(?)
<i>Bubas bubalus</i> Ol.	R, Rest (MI)
<i>Copris hispanus</i> L.	R
<i>Onthophagus taurus</i> L.	RR, Rest (MI)
<i>Onthophagus andalusiacus</i> Waltl.	R, Rest (MED+MI)

These five species of *Bubas*, *Copris*, and *Onthophagus* are horned dung beetles which occur in small numbers.

<i>Phyllognathus excavatus</i> Forst. (= <i>silenus</i> F.) [Rhinoceros Beetle; Maltese: Buqarn]	V(?)
<i>Dryctes nasicornis grypus</i> Ill. [Rhinoceros Beetle; Maltese: Buqarn]	V(?)

The above two species are occasionally met with and are large enough to encourage indiscriminate collecting or killing.

<i>Chitonitis hungaricus</i> Herbst	R, Rest (MI) (?)
<i>Oniticeilus fulvus</i> Goeze	R, Rest (MI) (?)
<i>Potosia cuprea metallica</i> Herbst	V(?)

The bright metallic colour of this relatively large beetle makes it conspicuous and encourages indiscriminate collecting.

<i>Potosia lugubris</i> Herbst	RR
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Recorded once only by Valletta (1979) and potentially threatened for the same reasons as *P.c. metallica*.

<i>Anoxia australis</i> (Schönh)	R, Rest (MI)
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First recorded by Bonnett & Schembri (1976) as *A. matutinalis* Lap. from Ghadira. It is possibly a recently introduced species associating with vines. The author has an additional unpublished record from Mellieha 28:v:70.

#### Family: BYRRHIDAE

A family of very small beetles about which little is known. A single still unstudied species occurs in the Maltese Islands.

(*) <i>Syncalypta</i> n. sp. (?)	●(?), 1
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This species, reported by Cameron & Caruana Gatto (1907), has not yet been evaluated taxonomically.

Family: HETEROCERIDAE (Mud Burrowing Beetles)

This family is represented locally by a single species, which is generally found on the muddy edges of ponds and watercourses. Both larvae and adults are mud burrowers.

*Heterocerus melitensis* Rit.

■, 1

An endemic species.

Family: DRYOPIDAE (Terrestrial Water Beetles)

The Dryopidae are beetles associated with fast and slow moving permanent streams and rivers. Only one species has been recorded from the Maltese Islands.

*Dryops algericus* Lucas

X(?)

First reported by Caruana Gatto (1894) and again by Cameron & Caruana Gatto (1907) as *Parnus algericus* Luc. Luigioni (1929) copied these records and Olmi (1976) repeated Luigioni's citation. A still unidentified species of *Dryops* which may or may not be this species is in the author's collection. Because of the scarcity of this species' habitat in the Maltese Islands, its status must be vulnerable if indeed it still exists locally.

Family: BUPRESTIDAE (Metallic Wood Borer Beetles)

Another small family, which consists of wood boring beetles which tunnel under the bark of trees. Others, however, bore into herbaceous plants. In the Maltese Islands this family is represented by four recorded species. However, five other species are represented in the author's collection.

*Capnodis tenebrionis* Linne

V

Sometimes found on fruit trees but never common; persecuted because mistakenly considered a pest. Reported by Cameron & Caruana Gatto (1907).

*Ptosima undecimmaculata* Herbst

R(?)

Taken by the author from Bingenma (ix:81) on *Prunus* sp. and possibly introduced with fruit trees.

*Anthaxia scutellaris* Gné

V

Previously unrecorded. Taken from Il-Ballut on 20:iv:80 by the author. Associated with *Quercus* sp.

*Anthaxia manca* Linne

R(?)

First taken on *Rhamnus* from Buskett (12:iii:77). Previously unrecorded.



Also a previously unrecorded species. Taken by the author from Wied il-Faham (14:v:79) on *Crataegus* sp.

*Agrilus obscuricollis* Kierew

R(?)

Reported by Cameron & Caruana Gatto (1907). Possibly associated with Poplar (*Populus* sp.).

**Family: CEBRIONIDAE**

This family, with a few members in the Mediterranean region, is represented in the Maltese Islands by one species only. These beetles live buried in the soil during the larval stage and feed on roots.

*Cebris gigas* F

R

Males are occasionally encountered, females are apterous and much rarer.

**Family: ELATERIDAE (Click Beetles)**

The locally recorded species of this family are few and some are recent discoveries. The adults have the ability to jump up into the air when overturned on their backs. The larvae feed on roots.

*Lacon punctatus* (Hbst.)

I

A recently recorded species of unknown status (Platia, 1985).

*Isidus moreli* Muls. & Ray.

R(?)

Recorded only by Cameron & Caruana Gatto (1907). Not confirmed by Platia (1985).

*Ischnodes schembrii* Platia

●(?), R(?)

A recently described and possibly endemic species (Platia, 1985).

*Cardiophorus beloni* Desbr.

V, Rest (MI-Cozo?)

**Family: LAMPYRIDAE (Fireflies; Maltese: Musbieh il-Lejl)**

This family consists of the famous fireflies, a single species of which is known from the Maltese Islands. In this group the male and female are totally different morphologically.

*Lampyrus* sp. ? *ambigena* Lac du V.

V

Although previously quite common, in recent years this species has begun to decline, possibly due to increased street lights in remote areas which affect its courtship habits. Cameron & Caruana Gatto (1907) gave the name of this species as *Lampyrus lareyniei* Duv. The name given above is based on material identified by the British Museum (Natural History).

**Family: CANTHARIDAE** [Soldier and Sailor Beetles]

A family of carnivorous beetles which are generally brightly coloured and often seen on flower heads. The local species of this family as listed by Cameron & Caruana Gatto (1907) number 22. However, these are now divided between four families namely, Lampyridae, Cantharidae, Melyridae and Drilidae.

*Malthodes malcolmi* Pic. ●(?), V

*Malthodes cameroni* Pic. ●(?), RR

Two species first described from the Maltese Islands and possibly endemic.

**Family: DERMESTIDAE** [Museum or Carpet Beetles]

A family of small beetles locally represented by eight species. Some members are pests of museum collections.

(\*) *Attagenus maltensis* Pic. ●(?), I

Listed only by Tonna Barthet (1931). Its taxonomic status needs revision.

*Anthrenus biscrensis* Rtt., I

Cameron & Caruana Gatto (1907) listed this species as very common while Tonna Barthet (1931) listed it among the rare species.

**Family: PTINIDAE** [Spider Beetles]

A family of very small beetles which have a superficial resemblance to small spiders. The status of the eight local species reported by Cameron & Caruana Gatto (1907) is unknown.

(\*) *Microptinus (Niptus) melitensis* Pic. ●(?), I

Listed only by Tonna Barthet (1931). Its taxonomic status needs revision.

**Family: CLERIDAE**

A family of brightly coloured beetles, only three species of which have been confirmed to occur on our islands. They are carnivorous or saprophagous and control wood boring and bark beetles of the families Buprestidae, Cerambycidae and Scolytidae.

*Tillus transversalis* Charp. R(?)  
[Maltese: Hanfusa tal-Qaqoċċ]

Occasionally found on flower heads of *Cynara* sp. (Lanfranco, 1971).

This species was recorded by Valletta (1979). This record possibly refers to the previous species.

**Family: MELYRIDAE**

Previously this family was incorporated with the Cantharidae by Cameron & Caruana Gatto (1907). Some 15 species occur locally. These beetles are generally found on flower heads and grasses.

*Attalus melitensis melitensis* Peyr. ●, V(?)

*Attalus melitensis testaceipes* Pic. ●, R(?)

This endemic species of *Attalus* is known in two forms: *A.m. melitensis* which is found more commonly, and *A.m. testaceipes* which is rarer.

*Haplocnemus melitensis* Schilsky ●, R

*Dasytiscus melitensis* Bourg ●, V

Both of these endemic species are associated with humid environments.

**Family: NITIDULIDAE**

A family of small beetles locally represented by about 11 species. These beetles show a variety of feeding habits ranging from phytophagous feeders to sap and fruit feeders to fungus feeders and also carnivorous species.

(\*) *Brachypterus* n.sp. ●(?), I

Listed by Cameron & Caruana Gatto (1907) and still not evaluated taxonomically.

*Pria dulcamarae* Scop. R(?), Rest (MI-Gozo?)

**Family: COCCINELLIDAE (Ladybird Beetles; Maltese: Koll)**

A family with about 17 brightly coloured local species, most of which are predators and which are an effective natural control of aphids, greenfly and scale insects. Some are phytophagous and sometimes associated with a single plant species as for example the common *Epilachna chrysomelina* F. which is associated with *Ecballium elaterium* (Squirting Cucumber; Maltese: Faqqus li-Mmir).

*Scymnus interruptus* Goeze v. *basalis* Redt. Rest (MI)

Although *S. interruptus interruptus* Gaeze is common, the variety *basalis* Gredl. seems to be restricted to northern Malta and to Gozo.

Family: TENEBRIONIDAE (Nocturnal Ground Beetles)

An important family with over 40 local species of which at least 10 and possibly 16 are endemic forms. Many of these species have fused elytra and are hence flightless and have poor dispersive powers, possibly accounting for the high degree of endemism.

*Tentyria laevigata leachi* Baudi

●

A common and widely distributed endemic subspecies. Also known from Filfla Island (Lanfranco, 1964).

(\*) *Tentyria bipunctata* Barthet

●(?)

A species of doubtful taxonomic status.

*Stenosia melitana* Rtt.

●

A widely distributed, endemic species.

*Stenosia schembrii* Canzoneri

●, I

A recently described (Canzoneri, 1979) and possibly endemic species.

*Stenosia hispana elongata* Sol.

I

Recorded by Tonna Barthet (1931) as rare.

*Akis melitana* Rtt.

●, I

Previously more common, now possibly on the decline. Also known from Filfla Island (Lanfranco, 1964).

*Alphasidia grossa melitana* Rtt.

●

Common and widely distributed; they are very often found on country footpaths and therefore are subject to accidental trampling.

*Pimelia sardoa goryi* Sol.

●

Common on waste ground and country lanes; subject to trampling.

*Pimelia rugulosa subscabra* Senac

●(?), I

This subspecies as given by Tonna Barthet (1931) does not seem to be identical to *subscabra* Sol. as given for *P. sardoa* by Cameron & Ceruana Gatto (1907). *P. rugulosa* is of doubtful occurrence.

(\*) *Pimelia quadripunctata* Tonna Barthet

●(?), I

This species, listed by Tonna Barthet (1931) and possibly described by him, is of doubtful taxonomic status.

*Crypticus cameroni* Rtt.

●(?), I



*Allophylax picipes melitensis* Baudi

Widely distributed; occurs also on the smaller islets.

*Opatrum melitense* Kust.

●, RR

*Opatrum emarginatum* Luc.

Rest (MED+MI)

Recently recorded from the Maltese Islands (Canzoneri, 1979) and known also from Tunisia.

*Clitobius ovatus* Er.

●, R, Rest (MI)

Recorded by Cameron & Caruana Gatto (1907) and listed as rare by Tonna Barthet (1931) and by Schembri & Schembri (in Savona Ventura et al., 1980) from Ghadira.

*Erodium siculus melitensis* Rieti

●, Rest (MI)

This subspecies of *E. siculus* is possibly synonymous with the *E. neapolitanus* Sol. recorded by Cameron & Caruana Gatto (1907) from Mellieħa (which possibly refers to Ghadira).

Specimens taken from the sand dunes at Ghadira and sent by the author to the British Museum (Natural History) were identified as *Erodium* sp. ? *emondii* Sol.; these also possibly refer to the same species.

*Helops rossii* Serv.

RR

Associated with dead trees. Possibly identical with the *H. pygmaeus* Kust. reported by Cameron & Caruana Gatto (1907). Author's unpublished record: Wied il-Qieħħa (Chadwick Lakes) 8.11.75.

*Ammobius rufus* Luc.

Rest (MI-Gozo?)

*Phaleria acuminata* Kust.

Rest (MI-Gozo?)

*Trachyscelis aphodoides* Lat.

Rest (MI-Gozo?)

These last three species were reported by Cameron & Caruana Gatto (1907) from single localities in Malta (i.e. Mellieħa and Ġnejna). Now they seem to be restricted to Ramla in Gozo (S. Schembri, personal communication).

Family: ALLECULIDAE

A family which was formerly included in the Tenebrionidae, to which it is related. Only two species occur locally, both apparently endemic.

*Omophilus melitensis* Baudi

●

*Omophilus championi* Ritt

●(?), I

The first named species is common and widely distributed. Cameron & Caruana Gatto (1907) describe the second as having a "pretty general" distribution.

**Family: OEDMERIDAE**

Members of this family are generally soft-bodied, elongated, metallic coloured beetles. The adults are found on flower heads but the larvae are wood borers. Five species have been recorded locally.

*Stenostoma melitense* Cameron

●, R(?)

An endemic species of a metallic grey-green colour. Bologna (1979) has recently confirmed its taxonomic status.

**Family: RHIPIPHORIDAE**

Beetles of this family are parasites of bees and wasps during their immature or larval stages. Only two species have been recorded from the Maltese Islands.

*Emenadia flabellata* Fabr.

I

Recorded only by Cameron & Caruana Gatto (1907).

*Rhipiphorus subdipterus* Fabr.

I

Recently recorded by Valletta (1984) from Wardija. Generally parasitic on *Halictus* bees.

**Family: MELOIDAE [Oil Beetles]**

Beetles of the family Meloidae are particularly interesting because of their complex life cycle, which includes parasitic stages on solitary bees and grasshoppers. At least eight species have been recorded locally, with six species in the genus *Meloe*.

*Meloe proscarabeus* Linne

R

Probably the *M. violaceus* Marsh of Cameron & Caruana Gatto (1907); also reported by this name by Bologna (1985) and by Porta (1934). Author's record: Wied is-Sewda, v:73.

*Meloe cavensis* Petagna

RR(?)

Recorded by Porta (1929) and Bologna (1985). Author's record: Msida 9:xii:69).

*Meloe mediterraneus* Muller

I

Recorded as *M. rugosus* Marsh by Cameron & Caruana Gatto (1907) and distribution given as "here and there". Also reported by Bologna (1985).

*Meloe murinus* Brandt & Erichson

I

Recorded only by Bologna (1985).

Recorded as "not so common" by Caruana Gatto (1894) and also by Cameron & Caruana Gatto (1907).

(\*) *Apalus bimaculatus caruanae* Rtt.

●(?), R(?).

The taxonomic status of this supposedly endemic form is doubtful. Various recorded as *Hapalus caruanae* Rtt. (Caruana Gatto, 1894), *Hapalus bimaculatus* L. v. *caruanae* Rtt. (Cameron & Caruana Gatto, 1907), *Apalus bimaculatus* Linne (Bologna, 1985) and as *H. bimaculatus* ab. *caruanae* Troch by Porta (1934).

*Mylabris (Eumylabris) fabricii* Saumacov

1

First reported by Bologna (1985) from a single specimen from Ta' Qali.

# Family: ANTHICIDAE

A family of small beetles with a superficial resemblance to the Carabidae; some species resemble ants. They are generally associated with plant refuse, manure etc. A few are associated with saline marshland while others are found in seaweed and eel-grass debris washed ashore. The family is represented locally by 13 species.

*Aulocoderus melitensis* Pic

●

An endemic species generally found on flowers. First described by Pic (1903) and later reported by Cameron & Caruana Gatto (1907). Confirmed by Bucciarelli (1980) who examined Pic's specimens at the Museum of Paris.

The following six species seem to be associated with saline marshland and are known from Marsa and Mellieha (Ghadira). The saltmarsh at Marsa no longer exists and similarly the associated fauna! That at Mellieha (Ghadira) is in a reduced state although now preserved as a nature reserve. Some of the species may be associated with decaying seagrass debris (*Posidonia*) that accumulates in the marshlands and on the beaches.

*Leptaleus rodriguezi* Latr.

X(?)

Recorded as *Anthicus rodriguezi* by Cameron & Caruana Gatto (1907). Also listed from Malta by Pic (in Porta, 1934) and Bucciarelli (1980).

*Cyclodinus humilis* Germ

X(?)

Also recorded is the variety *lameyi* Marsh.

*Cyclodinus minutus* (La Ferie)

X(?)

*Anthicus fenestratus* Schmidt

X(?)

*Anthicus tristis* Schmidt

R(?)

This is a previously unrecorded species in the author's collection (Manoel Island, 18:iv:74). The Sicilian and North African populations were described as ssp. *discrepans* Kriegerick. Bucciarelli (1980) however says that Sicilian specimens belong to *ssp. tristis* Sch.

**Family: ADERIDAE**

A small family with one local species which was previously included in the Anthicidae, to which it is related. Generally associated with bark and straw, also on the leaves and branches of shrubs.

*Hylophilus populneus* Panz. R(?)

Generally associated with the bark of Poplar (*Populus alba*). Reported as *Euglenes populneus* Panz by Cameron & Caruana Gatto (1907).

**Family: CERAMBYCIDAE** (Longhorn Beetles; Maltese: Buqrani)

This family, consisting of large and medium sized beetles, is locally represented by 23 recorded species which were recently revised by Schembri & Sama (1986). It contains generally wood feeding insects, immediately recognizable by their very long antennae.

*Gracilia minuta* Fabr. RR(?)

Known only from a single specimen from Buskett (Schembri & Sama, 1986).

*Cerambyx cerdo* Linn. [Maltese: Wirdiana tal-Mell] V

One of our largest insects. Its size make it vulnerable to indiscriminate killing.

*Cerambyx scopolii* Fuess. I

Recorded as a pest by Saliba (1963) but not confirmed by Schembri & Sama (1986).

*Ropalopus clavipes* (Fabricius) X(?)

Recorded by Cameron & Caruana Gatto (1907) but not confirmed by Schembri & Sama (1986).

*Chorophorus pilosus glabromaculatus* Goeze R(?)

Known from two specimens only (Schembri & Sama, 1986).

*Stenidia troberti* Mulsant RR(?)

Known only from a single specimen (Schembri & Sama, 1986).

*Calamobius filum* (Rossi) R(?)

Associated with grasses (*Galactites* spp.).



Reported by Caruana Gatto (1894) and by Cameron & Caruana Gatto (1907) but not confirmed by Schembri & Sama (1986).

(\*) *Obera erythrocephala melitana* Reiche

●(?), 1

The form *melitana* Reiche is of uncertain taxonomic status.

Family: CHRYSOMELIDAE [Leaf Beetles]

An important family as regards crop management and horticulture. Although many of its members are pests of crops, most are associated with wild plants and are harmless. Many are colourful and metallic and hence subject to indiscriminate collecting and killing. This family is locally represented by about 60 species divided into at least 20 genera as given in Caruana Gatto & Cameron (1907). Most genera are locally represented by one or two species only, however, the genus *Psylloides* has four species and one subspecies, *Phyllotetra* has five, *Aphthona* has four, *Chrysomela* has eight, while *Longitarsus* has 17 species. Most species are known from single records.

(\*) *Timarcha melitensis* Wr.

●(?), 1

A supposedly endemic species of unknown taxonomic status.

Family: CURCULIONIDAE [Weevils; Maltese: Bumunqar]

Another important family with over a hundred local species, some of which are of economic importance although the majority are harmless. This family was recently revised taxonomically by Magnano & Orsella (1973).

*Thylacites beloni* Desr.

Rest (MED)

Known only from the Maltese Islands, western Sicily and Crete.

*Ottiorhynchus affaber* Reitt

R, Rest (MED)

Known only from Malta, Sicily, Tunisia, Algeria and parts of Spain

*Ottiorhynchus moriger* Reitt

RR, Rest (MED)

Known only from the Maltese Islands and Corfu (Magnano & Orsella, 1973)

*Chiloneus delucci* Pesarini

●, R

An endemic species first described by Pesarini (1970).

*Ceutorhynchus melitensis* Schultze

R, Rest (MED)

Originally described from Malta but now known to occur in Sicily and the Italian provinces of Calabria, Gargano, Abruzzo and Marche (Magnano & Orsella, 1973).



Caruana Gallo A. (1925) - Sulla straordinaria diminuzione della entomofauna nella spiaggia delle baie di Marsa, Marsascala, e San Giorgio di Birzebbugia - *Archivum Melitense*, 6(4): 161-164.

Coiffait H. (1971) - Nouveau *Astenus* de la region palearctique occidentale. - *Nouvelle Revue d'Entomologie*, 1: 177-199.

Crowson R.A. (1967) - *The natural classification of the families of Coleoptera*. - London: E.W. Classey, 214pp.

Koch C. (1937) - Beitrag zur systematik und geographischen Verbreitung der *Achenium*-Arten (Col. - Staphilinidae). - *Pubblicazione del Museo Entomologico (P.Rossi) Duniò*, 12: 5-141.

Lanfranco G. (1964) - Coleoptera from Filfla Island *News and Views*, 1: 1 [Natural History Society of Malta].

Luigioni P. (1929) - I coleotteri d'Italia. Catalogo topografico sinonimico e bibliografico. - *Memorie della Pontificale Accademia delle Scienze (Roma) Ser.2a*, 13: 1-1160.

Magistretti M. (1965) - Coleoptera, Cicindelidae, Carabidae; *Catalogo Topografico*. - [Fauna d'Italia 8:] Bologna: Calderini, xv + 512pp.

Magnano L. & Osella G. (1973) - La curculionidofauna delle isole circumsiciliane; alcune osservazioni geografiche. - *Lavori della Società Italiana di Biogeografia N.S.*, 3: 3-31.

Olmi M. (1976) - Coleoptera - Dryopidae, Elminthidae [Fauna d'Italia 12]: Bologna: Calderini, x + 280pp.

Pesarini C. (1970) - I *Chiloneus* italiani con descrizione di tre nuove specie ed un nuovo sottogenere. - *Atti della Società Italiana di Scienze Naturali e Museo Civico di Storia Naturale, Milano*, 112: 373-383.

Pic M. (1903) - Coléoptères européens et 'Clytus' Syrien nouveau. - *Echange* 139.

Platia G. (1985) - Descrizione di due nuove specie di Elateridi Palearctici (Coleoptera) (V contributo alla conoscenza dei Coleoptera Elateridae). - *Bollettino della Società Entomologica Italiana*, 117(47): 93-96.

Poggi R. (1980) - Appunti su alcuni Pselaphidae e Scydmaenidae di Malta (Coleoptera) *Bollettino della Società Entomologica Italiana*, 112(9-10): 167-170.

Porta A. (1934) - *Fauna Coleopterorum italica Vol IV - Heteromera - Phytophaga*. - Piacenza; pp.33-48. (Meloidae), pp.19-33 (Anthicidae).

Puthz V. (1968) - Die *Stenus* und *Megalopinus* - Arten Motschulsky und Bemerkungen über das Subgenus *Tesnus* Rey, mit einer tabelle der palaarktischen Vertreter (Col. Staphilinidae), 54 Beitrag zur kenntnis der Steninae. - *Notulae Entomologicae*, 48: 197-219.

Saliba L.J. (1963) - *Insect pests of crop plants in the Maltese Islands* - Malta: Dept. of Information, 35pp.

Savona Ventura G., Schembri S.P., Lanfranco E., Schembri P.J., Lanfranco G. & Schembri J. (1980) - *Report on Ghadira prepared by the Natural Environment Study Section of the Society for the Study and Conservation of Nature*. - Valletta: Society for the Study and Conservation of Nature, 6pp.

Schembri P.J., Lanfranco E., Farrugia P., Schembri S. & Sultana J. (1987) - *Localities with conservation value in the Maltese Islands*. Malta: Environment Division, Ministry of Education, 27pp.

Schembri S.P. & Sama G. (1986) - The Cerambycidae of the Maltese Islands (Coleoptera). - *Bollettino della Società Entomologica Italiana*, 118(47): 93-100.

Schembri S.P. & Schembri J.L. (1982) - Recent records of Coleoptera Staphilinidae from the Maltese Islands. - *Lavori della Società Veneziana di Scienze Naturali*, 7: 45-53.

Tonna Barthet G. (1931) - A list of rare Coleoptera peculiar to the island of Malta. - *Science* 1 Sept. 1931, p.7.

Valletta A. (1979) - Insect pollinators on *Cynara cardunculus* L. - *Central Mediterranean Naturalist*, 1: 22.

Valletta A. (1984) - *Rhipiphorus subdipterus* Fabr - an addition to the Coleoptera of the Maltese Islands - *Potamon*, (12): 54.

Vienna P. (1980) - *Coleoptera Histeridae* [Fauna d'Italia 16] Bologna:Calderini, x + 386.

Vienna P. (1983) - Note su alcuni Histeridae (Coleoptera) dell'Arcipelago Maltese - *Lavori della Società Veneziana di Scienze Naturali*, 8: 49-54.



*Bytiscus circumflexus* F.





(a) The Grey Long-eared Bat, *Plecotus austriacus*, is one of several species of bats which occur in the Maltese Islands. (Photo: Joe Sultana).



(b) Adult male Blue Rock Thrush, *Monticola solitarius*, the national bird of Malta. (Photo: Klaus Strosberg).

# VERTEBRATES OTHER THAN BIRDS

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## INTRODUCTION

Vertebrates are the most conspicuous of animals and the most familiar to people. Many vertebrates are large and require proportionately large home ranges. These two factors combine to make vertebrates among the most threatened of all Maltese animals; loss of habitat as more and more land is developed for human use reduces population size while many species are killed for no other reason than out of fear or ignorance or both. Threat through loss of habitat and human persecution are recurrent themes in the species list that follows. The choice of which species to include in this list was difficult to make - in reality, apart from fishes and rodent pests, all local vertebrates are under threat in some way since the overall population has declined in recent years. The species listed below are those which are threatened by some identifiable factor, those which are endemic, rare or otherwise of particular interest, and those which by virtue of the habitat they occupy are particularly vulnerable to interference.

## SPECIES LIST

Class: ELASMOBRANCHII  
Order: Euselachii  
Family: Rajidae

*Raja (Leucoraja) melitensis* Clark                      Rest (MED)  
(Maltese Brown Ray; Maltese: Rajja ta' Malta)

A ray first discovered in the 1920's in Maltese waters (Clark, 1926) and long considered a variety of the Brown Ray *Raja miraletus*. It is now known to be a good species which occurs only in the central Mediterranean between Tunisia and the Maltese Islands although there is one record from the Italian coast (Turchio, 1960). *Raja melitensis* is frequent in Maltese waters (Lanfranco, 1974).

Class: ACTINOPTERYGII  
Order: Microcyprini  
Family: Cyprinodontidae

*Aphanius fasciatus* Nardo                      V, Rest (MED+MI)  
(Killifish; Maltese: Buttaqq)

This is the only true brackish-water fish in the Maltese Islands and apparently occurs as a local race (Darmanin, 1979). Populations are known from brackish-water inlets at Marsa, Salina, Kalafrana, Marsascala and Marsaxlokk and different sites appear to support different ecotypes (Zammit & Van Es, 1980). Populations have been introduced at a number of other sites including the Ghadira Nature Reserve. Except for the Ghadira population, which appears to be thriving, it is not known whether the other introduced populations have established themselves. Some of the natural populations are declining rapidly due to anthropogenic factors (e.g. hypersaline discharges from the reverse osmosis plant at Marsa; dredging and dumping at Marsaxlokk and Salina). An additional threat to the species is indiscriminate collecting by aquarists (Gilia, 1986).

Class: AMPHIBIA  
Order: Salientia  
Family: Discoglossidae

*Discoglossus pictus pictus* Otth V, Rest (MED+MT)  
[Painted Frog; Maltese: Żring]

The only amphibian to occur in the Maltese Islands (Lanfranco, 1955). Once common in all localities with some freshwater, it is now becoming more restricted due to habitat destruction, pollution and persistent persecution; a common 'sport' amongst local children is frog- and tadpole-hunting (Schembri, 1983a). The Painted Frog was originally thought to extend through western and southern Europe and Northwest Africa but recent studies have revealed that actually a number of distinct species exist. *Discoglossus pictus* is now known to have a much more restricted distribution, being present only in Sicily and the Maltese Islands (as the subspecies *pictus*), in Tunisia and Algeria (as the subspecies *auritus*) and in Morocco (as the subspecies *scovazzi*) (Lanza et al., 1986). All amphibians are listed in Appendix III (protected fauna) of the Berne Convention (1979).

Class: REPTILIA  
Order: Testudines  
Family: Cheloniidae

*Caretta caretta* (Linnaeus) V  
[Loggerhead Turtle; Maltese: Fekruna tal-Baħar]

This species is indiscriminately fished for food, for its shell and sometimes also for sport; populations are declining all over the Mediterranean and this species is listed in the IUCN's Reptiles & Amphibians Red Data Book as 'depleted'. The Loggerhead originally used to breed on the sandy beach at Ramla in Gozo, but this nesting site was abandoned in the 1910's due to disturbance (Savona Ventura, 1979a). Given the present degree of use of this beach, it is unlikely that this site will be utilized again by these turtles. Listed in Appendix I of CITES (IUCN, 1973) and in the Bonn and Berne Conventions (1979).

*Chelonia mydas* (Linnaeus) RE  
[Green Turtle; Maltese: Fekruna tal-Baħar]



Very occasionally occurs in Maltese waters. Since local fishermen do not make any distinction between this species and the Loggerhead, it is taken when encountered for the same purposes: as an article of food, for the shell and for sport. Listed in the IUCN's Reptiles & Amphibians *Red Data Book* as 'depleted', in Appendix I of CITES (IUCN, 1973), and in the Bonn and Berné Conventions (1979).

*Lepidochelys kempii* (Garman) 1  
[Kemp's Ridley; Maltese: Fekruna tal-Baħar]

An Atlantic species that has to date been taken once only from the Mediterranean, when a specimen was captured off the northeastern coast of Malta in 1929 (Brongersma & Carr, 1983). It is not known whether this is an accidental occurrence or whether Kemp's Ridley does occasionally enter the Mediterranean. Listed in the IUCN's Reptiles & Amphibians *Red Data Book* as 'critically endangered', in Appendix I of CITES (IUCN, 1973), and in the Bonn and Berné Conventions (1979).

Family: Dermochelyidae

*Dermochelys coriacea* (Linnaeus) 2  
[Leatherback Turtle; Maltese: Fekruna tal-Baħar]

Occasionally occurs in Maltese waters (Lanfranco, 1983) and when encountered, usually landed by fishermen often to be used as bait. Listed in the IUCN's Reptiles & Amphibians *Red Data Book* as 'critically endangered', in Appendix I of CITES (IUCN, 1973), and in the Bonn and Berné Conventions (1979).

Order: Squamata  
Family: Gekkonidae

*Tarentola mauritanica* (Linnaeus) V  
[Moorish Gecko; Maltese: Wiżgha tal-Kampanja]

*Hemidactylus turcicus turcicus* (Linnaeus) V  
[Turkish Gecko; Wiżgha tad-Djar]

Both species are widespread in the Maltese Islands and until recently, both were quite common. Populations are now declining somewhat due to destruction of habitat and human persecution; there exists a local belief that geckoes are associated with skin diseases (Savona Ventura, 1983a). All reptiles are listed in Appendix III (protected fauna) of the Berné Convention (1979).

Family: Chamaeleonidae

*Chamaeleo chamaeleon* (Linnaeus) V, Rest (MI)  
[Mediterranean Chameleon; Maltese: Kamaleont]

The Chameleon is not an indigenous species in the Maltese Islands but a number of individuals were imported from North Africa and released in a garden at St. Julians around 1880, from where they escaped and spread. The Chameleon now occurs in scattered populations in localities possessing some tree or shrub cover (Lanfranco, 1966; Savona Ventura, 1975). Specimens are collected from the wild to be kept as pets or sold in markets (Schembri, 1983b). Listed in Appendix II (strictly protected



fauna) of the Berne Convention (1979); all *Chamaeleo* species are listed in Appendix II of CITES (IUCN, 1973).

**Family: Lacertidae**

*Podarcis filfolensis* (Bedriaga) Rest (MED)  
[Maltese Wall Lizard; Maltese: Gremxula]

*Podarcis filfolensis*, the only lacertid to inhabit the Maltese Islands, is a Pelagio-Maltese endemism with five named geographical races, one of which, *P.f. laurentimuellerei*, occurs on the Pelagian islands of Linosa and Lampione, and the other four restricted to various islands of the Maltese group (Lanza, 1972). The lizards are common where found although destruction of habitat has caused some populations to decline. The populations of the smaller islands are very small and therefore highly vulnerable to any man-made or natural disasters. Listed in Appendix II (strictly protected fauna) of the Berne Convention (1979).

*P.f. filfolensis* (Bedriaga) ●(Filfla), V, Rest (MI)

This is the nominate subspecies which inhabits the island of Filfla, a rock slightly more than 2ha in area, situated some 4km off the southern coast of Malta.

*P.f. generalensis* (Gulia) ●(Fungus Rock), V, Rest (MI)

Found only on Fungus Rock (or General's Rock), a small rock some 0.7ha in area just off the coast of Dwejra in Gozo.

*P.f. kieselbachi* (Fejérváry) ●(Selmunett Islands), V, Rest (MI)

Occurs on Selmunett Islands (also known as St. Paul's Islets), small rocks with a total area just over 10ha, off the coast of Tal-Biata in northeastern Malta.

*P.f. maltensis* Mertens ●(Malta, Gozo, Comino)

Populates the main islands of Malta, Gozo and Comino. There is some indication that the population of *P. filfolensis* of the islet of Cominotto off the west coast of Comino, is different from the ssp. *maltensis* (Savona Ventura, 1983b).

**Family: Scincidae**

*Chalcides ocellatus tiligugu* (Gmelin) V, Rest (MED)  
[Ocellated Skink; Maltese: Xaxmet l-Art]

Apart from the Maltese Islands, this subspecies occurs also in North Africa (Algeria and Tunisia), Sardinia, Sicily and several minor islands. Locally it is quite common but populations are declining due to habitat destruction and human persecution; there is a popular but mistaken belief that skinks are harmful. All reptiles are listed in Appendix III (protected fauna) of the Berne Convention (1979).

Order: Ophidia  
Family: Colubridae

*Coluber algerus* (Jan) V, Rest (MED+MI)  
[Algerian Whip-snake; Maltese: Serp]

*Coluber viridiflavus carbonarius* Bonaparte V  
[Black Whip-snake; Maltese: Serp Iswed]

*Elaphe situla leopardina* (Bonaparte) V, Rest (MED)  
[Leopard Snake; Maltese: Lifghal]

*Telescopus fallax fallax* (Fleischmann) V, Rest (MED+MI)  
[Cat Snake; Maltese: Serp]

For *Coluber algerus*, the Maltese Islands are the only European station of this essentially Northwest African species. *Elaphe situla leopardina* is an eastern Mediterranean (Balkan) subspecies that in the Central Mediterranean is found in southern Italy, eastern Sicily and the Maltese Islands. *Telescopus fallax fallax* is similarly an eastern Mediterranean (Balkan) species whose only Central Mediterranean station is the Maltese Islands (Lanza, 1972). The Algerian Whip-snake and the Cat Snake are rare species locally; the other two are widespread and relatively common. All four species suffer from loss of habitat and from human persecution. There is a popular local belief that all snakes are dangerous. *Elaphe situla* is listed in Appendix II (strictly protected fauna) of the Berne Convention (1979); all other snakes are listed in Appendix III (protected fauna).

Class: MAMMALIA  
Order: Insectivora  
Family: Erinaceidae

*Erinaceus algerus* Duvernoy & Lereboullet I  
[Algerian Hedgehog; Maltese: Qanfud]

Only one species of hedgehog occurs in the Maltese Islands (Lanfranco, 1969). In some rural areas it is persecuted because of a mistaken belief that it steals milk from domestic sheep and goats (J. Sultana, personal communication). More importantly, large numbers of hedgehogs are killed each year by motor vehicles on country roads. This and habitat destruction are contributing to a reduction in the local hedgehog populations.

Family: Soricidae

*Suncus etruscus* (Savi) V(?)  
[Pygmy White-toothed Shrew; Maltese: Ġurdien ta' Halqu Twill]

*Crocidura suaveolens* Pallas V, Rest (MI-Gozo?)  
[Lesser White-toothed Shrew]

*Crocidura russula* (Hermann) I, Rest (MI) (?)  
[Greater White-toothed Shrew]

Three species of shrews are known to occur in the Maltese Islands, of which the commonest and most widespread is the Pygmy White-toothed Shrew. The Lesser White-toothed Shrew has to date been definitely recorded only from the island of Gozo where it is rarer than *Suncus etruscus*. The Greater White-toothed Shrew is also known only from the island of Gozo and appears to be the rarest of the local shrews, it being known only from a few skull remains extracted from owl pellets (Schembri & Schembri, 1979). All Soricidae are listed in Appendix III (protected fauna) of the Berne Convention (1979).

Order: Chiroptera  
Family: Rhinolophidae

*Rhinolophus ferrumequinum* (Schreber) RR  
[Greater Horseshoe Bat; Maltese: Farfett il-Lejl tan-Naghla Kbir]

*Rhinolophus hipposideros* (Beckstein) V  
[Lesser Horseshoe Bat; Maltese: Farfett il-Lejl tan-Naghla Żgħir]

Family: Vespertilionidae

*Myotis blythi punicus* Felten V, Rest (MED)  
[Lesser Mouse-eared Bat; Maltese: Farfett il-Lejl Widnet il-Ġurdien]

*Myotis myotis* (Borkhausen) V  
[Greater Mouse-eared Bat; Maltese: Farfett il-Lejl Widnet il-Ġurdien Kbir]

*Plecotus austriacus* (Fisher) V  
[Grey Long-eared Bat; Maltese: Farfett il-Lejl tal-Widnejn Kbar]

*Miniopterus schreibersi* (Kuhl) R  
[Schreiber's Bat; Maltese: Farfett il-Lejl ta' Xrajber]

*Pipistrellus pipistrellus* (Schreber) V  
[Common Pipistrelle; Maltese: Pipistrell]

*Pipistrellus kuhli* (Kuhl) R  
[Kuhl's Pipistrelle; Maltese: Pipistrell ta' Kuhl]

*Vespertilio serotinus* (Schreber) RR  
[Serotine; Maltese: Serotin]

*Nyctalus noctula* (Schreber) RR  
[Noctule; Maltese: Noktula]

All Maltese bats are threatened as their roosting places, which include caves and old buildings, are removed or disturbed, while they are also occasionally aimlessly persecuted (Lanfranco, 1969). A marked decrease in the overall bat population has been observed in recent years. One species is of particular interest: apart from the Maltese Islands, *Myotis blythi punicus* occurs only in Corsica, Sardinia and parts of

northern Tunisia (Felten et al., 1977). All species except *Pipistrellus pipistrellus* are listed in Appendix II (strictly protected fauna) of the Berne Convention (1979); *Pipistrellus pipistrellus* is listed in Appendix III (protected fauna).

Order: Rodentia  
Family: Muridae

*Apodemus sylvaticus* (Linnaeus) I  
[Wood Mouse; Maltese: Ġurdien tar-Raba']

Recorded a few times only from the Maltese Islands (Lanfranco, 1969; Savona Ventura, 1981) but may be much commoner than existing records indicate because it is easily confused with *Mus musculus* which is very common.

Order: Carnivora  
Family: Mustelidae

*Mustela nivalis* (Linnaeus) RR(?)  
[Weasel; Maltese: Ballotta]

The only native terrestrial carnivore in the Maltese Islands; very infrequently seen although this may be partly due to its retiring habits. The status of this species is not really known but given the increasing development of the countryside, the local weasel population may be declining due to loss of habitat. Listed in Appendix III (protected fauna) of the Berne Convention.

Order: Pinnipedia  
Family: Phocidae

*Monachus monachus* (Hermann) RR, Rest (MED)  
[Mediterranean Monk Seal; Maltese: Monka]

Very occasionally, individuals are sighted in Maltese waters; most of these are senselessly killed. The Mediterranean Monk Seal is one of the most seriously threatened animals in Europe, with fewer than 500 individuals surviving. This species and its habitat are both strictly protected under the Berne Convention (Council of Europe, 1985) and listed also in the Bonn Convention (1979). All species of the genus *Monachus* are listed in Appendix I of the CITES Convention (IUCN, 1973).

Order: Cetacea  
Family: Delphinidae

*Delphinus delphis* (Linnaeus) V  
[Common Dolphin; Maltese: Denfil]

*Tursiops truncatus* (Montagu) V  
[Bottle-nosed Dolphin; Maltese: Denfil Geddumu Qasir]

*Grampus griseus* (Cuvier) V  
[Risso's Dolphin; Maltese: Denfil ta' Risso]

*Globicephala melasena* (Traill) V  
[Long-finned Pilot Whale]



*Pseudorca crassidens* (Owen)  
[False Killer Whale; Maltese: Psewdorkal]

V

Family: Phocoenidae

*Phocoena phocoena* (Linnaeus)  
[Porpoise; Maltese: Denfil Iswed]

RR

Dolphins are common in Maltese waters but since they are notoriously difficult to identify, little information about the individual species concerned is available and the status of most is unknown; all are however threatened due to human persecution, often for no other reason than 'sport' (Lanfranco, 1969; Savona Ventura, 1979b). *Delphinus delphis*, *Tursiops truncatus* and *Phocaena phocaena* are listed in Appendix II (strictly protected fauna) of the Berne Convention (1979); all other species are listed in Appendix III (protected fauna).

#### REFERENCES

- Berne Convention (1979) - *Convention on the conservation of European wildlife and natural habitats*.
- Bonn Convention (1979) - *Convention on the conservation of migratory species of wild animals*.
- Brongersma L.D. & Carr A.F. (1983) - *Lepidochelys kemp* (Garman) from Malta. - *Proc. Koninklijke Nederlandse Akademie van Wetenschappen ser. C*, 86(4): 445-454.
- Cilia J.L. (1986) - Il-Buzaqq (*Aphanius fasciatus*). - *Potamon*, 15: 131-136.
- Clark R.S. (1926) - Rays and skates: a revision of European species. - *Fish. Scot. Scient. Invest.*, 1: 1-66.
- Council of Europe (1985) - *Naturopa: Newsletter-Nature*; special issue on *Monachus monachus*.
- Darmanin L. (1979) - The only killifish in Maltese waters. - *The Sunday Times*, March 11th, p.12.
- Felten H.; Spitzenberger F. & Storch G. (1977) - Zur Kleinsaugerfauna West-Anatoliens. Teil III. - *Senckenbergiana Biol.*, 58: 1-44.
- IUCN (1973) - *Convention on International trade in endangered species of wild Fauna and Flora*. Prepared and adopted by the Plenipotentiary Conference to conclude an International Convention on trade in Certain Species of Wildlife held at Washington D.C. from 21 February to 2 March 1973.
- Lanfranco G.G. (1955) - Reptiles, amphibians of the Maltese Islands. - *Malta Year Book*, 1955: 198-203.
- Lanfranco G.G. (1966) - The Chameleon in Malta. - *Times of Malta*, May 12th.

- Lanfranco G.G. (1969) - *Maltese mammals (Central Mediterranean)*. - Malta, 28pp. + plates 1-8.
- Lanfranco G.G. (1974) - *A complete guide to the fishes of Malta (Central Mediterranean)*. - Malta: Progress Press, 96pp. + plates 1-42.
- Lanfranco G.G. (1983) - Landings of *Dermochelys coriacea* Linn. (Reptilia, Dermochelidae) in Malta (Central Mediterranean). - *The Central Mediterranean Naturalist*, 1(2): 43-45.
- Lanza B. (1972) - Gli anfibi e i rettili delle isole circumsiciliane. - *Lav. Soc. Ital. Biogeogr. n. ser.*, 3: 755-804.
- Lanza B.; Nascetti G.; Capula M. & Bullini L. (1986) - Les Discoglosses de la région Méditerranéenne Occidentale (Amphibia, Anura; Discoglossidae). - *Bull. Soc. Herp. France*, 40: 16-27.
- Savona Ventura C. (1975) - The European chameleon. - *The Maltese Naturalist*, 2(2): 41-43.
- Savona Ventura C. (1979a) - Sea turtles. - *Hyphen*, 11(2): 96-100.
- Savona Ventura C. (1979b) - Whales and dolphins in Malta's seas. - *Potamon*, 3: 30-33.
- Savona Ventura C. (1981) - On the occurrence of *Apodemus sylvaticus* (Linnaeus) (Mammalia, Rodentia, Muridae) in the Maltese Islands with notes on other Maltese rodents. - *Animalia*, 8(1/3): 83-86.
- Savona Ventura C. (1983a) - Reptiles and amphibians in Maltese medical folklore. - *Civilization*, 10: 258-259.
- Savona Ventura C. (1983b) - The herpetofauna of Gomino and satellite islets with a note on the coloration of *Podarcis filfolensis*. - *Animalia*, 10(1/3): 87-93.
- Schembri P.J. (1983a) - The painted frog "iż-żring". - *Civilization*, 5: 126-127.
- Schembri P.J. (1983b) - The Mediterranean chameleon. - *Civilization*, 9: 238-239.
- Schembri P.J. & Schembri S.P. (1979) - On the occurrence of *Crocidura suaveolens* Pallas (Mammalia, Insectivora) in the Maltese Islands with notes on other Maltese shrews. - *The Central Mediterranean Naturalist*, 1(1): 18-21.
- Turchio M. (1969) - Rinvenimento del primo maschio di *Raja melitensis* Clark. - *Natura*, 51(2): 65-69.
- Zammit C. & Van Es H. (1980) - *Aphanius fasciatus* Valenciennes 1821. - *Kill News: J. Brit. Killifish Ass.*, 179: 141-144.

# BIRDS

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## INTRODUCTION

The ornithology of the Maltese Islands is dominated by seasonal migrations. About 360 species have been recorded. Of these, approximately 13 are resident, 5 are summer visitors, 52 are winter visitors, 112 are more or less regular migrants and 178 are rare and irregular migrants or vagrants. Some species which breed in the islands occur also as migrants.

This list includes only those species which are threatened as *breeding species* on a national level. The main factors which cause threat may be summed up as human interference, mainly bird shooting and trapping which is carried out intensively, and disturbance and loss of habitat. Taking into account the above factors as well as the human population density vis-à-vis the surface area of the Islands, it is not surprising that many breeding species are on the decline.

Occasional breeding species (e.g. Short-eared Owl *Asio flammeus*, Turtle Dove *Streptopelia turtur*, Swallow *Hirundo rustica*, House Martin *Delichon urbica*, Black-eared Wheatear *Oenanthe hispanica*, Reed Warbler *Acrocephalus scirpaceus*, as well as other species which have been recorded to breed once or twice in former years) are not included in the following list. The Jackdaw *Corvus monedula*, which was once a common resident and which was exterminated as a breeding species in the mid-fifties, is also not included. One must add that all breeding species have since 1980 been legally protected in the Maltese Islands.

Unless otherwise indicated all statements are based on the comprehensive work by Sultana & Gauci (1982) or are personal observations.

## SPECIES LIST

Order: PROCELLARIIFORMES

Family: Procellariidae

*Calonectris diomedea diomedea* (Scopoli) V, Rest (MED)  
[Cory's Shearwater; Maltese: Ċiefal]

Still a fairly common breeding bird. However the two largest colonies are rather vulnerable and threatened by development. The species suffers immensely from bird-shooting at sea from boats and dinghies.

*Puffinus puffinus yelkouan* (Acerbi) V, Rest (MED)  
[Manx Shearwater; Maltese: Ġarnija]

Small colonies are scattered along suitable sea cliffs; some colonies are threatened by development and by human interference and disturbance.

Family: **Hydrobatidae**

*Hydrobates pelagicus* (Linnaeus) V, Rest (MI-Filfla)  
[Storm Petrel; Maltese: Kangu ta' Filfla]

Only one known colony which is restricted to Filfla Islet. The islet, which was used by the services for bombing practice until 1970, was declared a nature reserve in 1988. Any development on this rock would result in the extermination of the entire breeding population.

Order: **ACCIPITRIFORMES**

Family: **Falconidae**

*Falco tinnunculus* Linnaeus E  
[Kestrel; Maltese: Spanjulett]

The few pairs, which try to breed annually are usually unsuccessful due to bird shooting. Otherwise it is a fairly common passage migrant in spring and autumn with a few birds occurring in winter.

*Falco peregrinus brookei* Sharpe E, Rest (MED)  
[Peregrine; Maltese: Bies]

Exterminated as a regular breeding bird through bird shooting for mounted bird collections. The last breeding record was in 1979. Since then single birds have been recorded but breeding has not been confirmed.

Order: **GALLIFORMES**

Family: **Phasianidae**

*Coturnix coturnix* (Linnaeus) E  
[Quail; Maltese: Summiena]

A few pairs try to breed annually but rarely succeed due to human interference, mainly shooting. Otherwise it is a fairly common spring and autumn migrant.

Order: **GRUIFORMES**

Family: **Rallidae**

*Gallinula chloropus* (Linnaeus) RR  
[Moorhen; Maltese: Gallozz Iswed]

A few pairs have been breeding regularly in the last five years. The first breeding record was in 1984 in Malta (Doublet & Portelli, 1986-87) and in 1987 in Gozo (Sultana *et al.*, 1988). Breeding restricted due to lack of suitable habitat as well as to human interference. It is a



fairly common passage migrant in spring and autumn with a few birds wintering at the Ghadira Nature Reserve.

**Order: CHARADRIIFORMES**

**Family: Laridae**

*Larus cachinnans michahellis* Naumann V  
[Yellow-legged Gull; Maltese: Gawwiġa Prima]

Breeds in a few small colonies at the southwestern coast of Malta and Gozo, and on Filfla. Colonies in Malta and Gozo have markedly decreased due to human disturbance, particularly shooting.

**Order: STRIGIFORMES**

**Family: Tytonidae**

*Tyto alba* (Scopoli) E  
[Barn Owl; Maltese: Barbagann]

Reduced to 1-2 pairs in the last decade due to shooting and nest robbing for mounted bird collections. The last recorded breeding pair was shot in 1988 (Fenech & Balzan, 1988). Other single birds have been recorded but breeding has not been confirmed.

**Order: PASSERIFORMES**

**Family: Aludidae**

*Calandrella brachydactyla* (Leisler) V  
[Short-toed Lark; Maltese: Bilblal]

This species has decreased drastically on the island of Malta due to loss of habitat and human disturbance. Although this summer visitor is still fairly common on the island of Gozo, a marked decrease has also been noted there.

**Family: Turdidae**

*Monticola solitarius* (Linnaeus) V  
[Blue Rock Thrush; Maltese: Merill]

Still fairly common as a breeding bird on Gozo; less so in Malta. It has decreased drastically in the last 25 years mainly due to human interference especially nest robbing and disturbance. It is now mainly confined to sea-cliffs. The Blue Rock Thrush is the National Bird of Malta.

**Family: Sylviidae**

*Cettia cetti* (Temminck) V  
[Cetti's Warbler; Maltese: Bagħal ta' l-Għolliq]

Established itself in the islands in the past 20 years. It is fairly widespread but localized due to lack of suitable habitat.

*Sylvia conspicillata* Temminck E  
[Spectacled Warbler; Maltese: Bufula Mamra]

Decreased drastically in the past 15-20 years. Actual reasons unknown but certainly include loss of habitat and disturbance.

Family: Muscicapidae

*Muscicapa striata* (Pallas) RR, Rest (MI-Malta)  
[Spotted Flycatcher; Maltese: Żanzarell tat-Tikkil]

Only a few pairs breed in one or two localities. Reasons for this are mainly lack of suitable habitat and human disturbance. Otherwise it is a fairly common spring and autumn migrant.

Family: Laniidae

*Lanius senator* Linnaeus E  
[Woodchat Shrike; Maltese: Kaċċamendula]

Very few pairs succeed in breeding annually due to bird-shooting and disturbance. As a passage migrant it is fairly common.

Family: Passeridae

*Passer montanus* (Linnaeus) V  
[Tree Sparrow; Maltese: Għammieł tas-Siġar]

Occurs as a breeding resident in fairly small numbers, breeding in small scattered colonies and as isolated pairs. The low population size may be the result of competition with the abundant resident the Spanish Sparrow (*Passer hispaniolensis*; Maltese: Għammieł tal-Bejt).

Family: Fringillidae

*Fringilla coelebs* Linnaeus E  
[Chaffinch; Maltese: Sponsun]

*Serinus serinus* (Linnaeus) E  
[Serin; Maltese: Apparell]

*Carduelis chloris* (Linnaeus) E  
[Greenfinch; Maltese: Verdun]

*Carduelis cannabina* (Linnaeus) E  
[Linnet; Maltese: Ġojjin]

A few pairs of these finches breed annually but are continuously harassed by bird trappers. As autumn passage migrants and winter visitors they are quite common.

Family: Emberizidae

*Miliaria calandra* (Linnaeus)

V

[Corn Bunting; Maltese: Durrajsal]

Still fairly common on Gozo; much less so on Malta. It is threatened by disturbance, nest robbing and loss of habitat.

#### REFERENCES

Doublet J. & Portelli P. (1986-87) - First breeding records of the moorhen in the Maltese Islands. - *Il-Merill* 24: 20.

Fenech N. & Balzan S. (1988) - Last known pair of barn owls *Tyto alba* shot. - *Il-Merill* 25: 13-14.

Sultana J; Cachia Zammit R. & Borg J. (1988) - First breeding records of the moorhen *Gallinula chloropus* in Gozo. - *Il-Merill* 25: 14.

Sultana J. & Gauci C. (1982) - *A new guide to the birds of Malta*. - Valletta: The Ornithological Society, 207pp.

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FOR THE  
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*compiled by:* GLORIANNE AXISA



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